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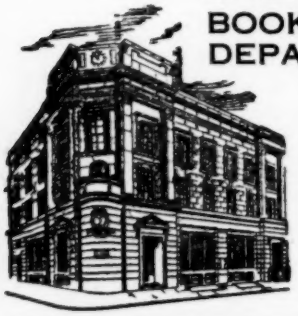

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ADDRESSES AND ORIGINAL ARTICLES

THE PSYCHOLOGICAL FACTOR IN CARDIAC PAIN

By Geoffrey Bourne, M.D., F.R.C.P. Lond.
PHYSICIAN WITH CHARGE OF OUT-PATIENTS AND IN CHARGE OF THE CARDIOGRAPHIC DEPARTMENT, ST. BARTHOLOMEW'S HOSPITAL

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(*From the Cardiographic Department, St. Bartholomew's Hospital*)

During the investigation into the various types of cardiac pain, which has extended over a period from 1929 to the present time, attention has particularly been directed to the various clinical pictures presented by the different types of pain. These separate themselves out into coronary thrombosis, angina of effort, spasmodic angina, and angina innocens, and the main points of difference between the types have been stressed in a previous communication (Bourne 1935).

Of the patients suffering from angina innocens, an unusually high proportion gave a history indicating undue worry, psychical stress, phobias, and similar disturbances. This suggested that some severe psychological abnormality might be acting as a causative factor in the angina innocens group of patients, and it was decided to investigate the incidence of psychological disturbance in all types of cardiac pain. The results show that although the incidence of psychological disturbance is higher in patients with cardiac pain than in patients with organic disease of the heart without pain, the increase is not confined to the angina innocens group. Distinct differences have been observed, however, both in the incidence and in the type of psychological disturbance in angina innocens. The present paper presents figures showing the incidence of psychological disturbance in the various types of cardiac pain, and discusses the possible links between the individual cardiac lesions known to produce pain and the actual pain produced. In a subsequent paper E. W. will discuss the possible psychogenic origin of such pain in these patients.

REVIEW OF OTHER WORK

The ancient Greeks referred to the diaphragm, the Hebrews to the bowels, and the eighteenth-century English to the bile and the spleen, as sources of emotion. The conception of the heart as the actual and the symbolic seat of feeling, life, and personality is at present nearly universal; phrases such as good-hearted and heartless require no further elucidation. In cases, therefore, where a psychological condition might manifest itself by physical symptoms it could reasonably be expected that an emotional crisis or a threat to the individual might manifest itself physically by cardiac pain. This point is considered in greater detail in E. W.'s paper.

Mackenzie (1923) states: "If a patient with a tendency to angina pectoris, or one who has the conditions favourable to its production, suffers from a period of sleeplessness, angina pectoris is very apt to be produced, particularly in people with a rather highly strung nervous system."

Viko (1926) reported a study of 23 cases where the cardiac neurosis was associated with rheumatic valvular disease. He contrasted these cases with 100 cases without neurosis and with 50 cases with cardiac neurosis but without an organic lesion. He found that (1) cardiac symptoms—namely, dyspnœa, palpitation, and precordial pain; (2) neurocirculatory symptoms; (3) symptoms referrable to organic disease of other organs; and (4) those without an organic lesion in other organs, were as follows:—

	Valvular lesion and neurosis.	Neurosis alone.	Lesion alone.
Cases	23	50	100
Symptoms—			
(1) Cardiac	100	98	70
(2) Neurocirculatory	87	24	9
(3) From disease elsewhere	17	14	39
(4) No disease elsewhere	65	54	2

This seems to show that patients with neurosis are more liable to develop symptoms in the presence of organic disease. He remarks that: "The occurrence of disturbances of sensation in a case of valvular heart disease should lead to a suspicion of the presence of a complicating neurosis." He found also that in the neurosis group emotion and not exertion was the chief factor in the production of symptoms, and that improvement or regression coincided with the varying emotional states rather than with the amount of physical activity. The opposite was true in patients with organic heart disease and without neurosis.

Paul White (1931) states: "A sensitive person may have little obvious pathology, anatomical or physiological, and yet suffer from severe angina pectoris; an insensitive person may have extensive coronary disease or other factor limiting the coronary circulation and yet have no angina pectoris at all," and "The nervous state of the patient is of some importance in judgment about the prognosis; other things being equal, the more sensitive and nervous the patient the less serious is the prognosis, for it takes much less pathology to cause symptoms in a sensitive person than in one who is lethargic or placid."

Conner (1930) observed: "It is not to be supposed that organic heart disease is found only in individuals with a stable mind and nervous system; and when it appears in persons whose mental make-up predisposes them to apprehensions and fears, one may expect to find evidence of this tendency in the appearance of symptoms which cannot reasonably be ascribed to the organic disease present."

Stewart Roberts (1931) states: "Angina occurs usually in the sensitive nervous type, as the Jew, or in the tense efficient American, rather than in the dull happy negro, or the calm accepting Chinaman."

Dunbar (1935) refers to the same point, quoting Gallavardin (1925), who states: "If the spasmogenic aptitude is great, a slight stimulus of neurogenic nature will suffice to evoke the spasm with its characteristic pain. If the spasmogenic aptitude is absent, the utmost stimulus will fail to evoke the spasm."

The relationship of psychological disturbance and cardiac pain is discussed by a number of other authors (Kilgore 1929, Gibson 1930, Brooks 1928, Foster 1927, Dmitrenko 1926, Richardson 1933).

It is thus apparent that this association has often been investigated. There appears, however, to have been no attempt hitherto to analyse its incidence in the various types of cardiac pain.

General Theoretical Considerations

If the four types of cardiac pain are considered in terms of their underlying pathology the part that may be played in the production of pain by psychological factors in each case will become to some extent apparent.

CORONARY THROMBOSIS

The cardiac pain of coronary thrombosis is severe, whether it occurs in a normally balanced individual

or in one suffering from a psychological disturbance, although it is obvious that an unduly sensitive patient will suffer more pain. An occasional case of coronary hrombosis is known to be painless, but this is a comparatively rare exception.

ANGINA OF EFFORT

The history of the type of pain in angina of effort is strongly suggestive of an underlying organic lesion; for the severity and speed of onset of the pain is in all cases proportional to the amount of exertion undertaken. A high proportion of patients with angina of effort suffer from pain also as a result of emotion, such as excitement, apprehension, or anger, which is the equivalent of exertion in its effect upon the heart. Excitement clearly produces three definite physical changes, an increase in heart rate, an increase in blood pressure, and the nervous changes resulting from an increased sympathetic tone, the latter presumably being partially an adrenaline effect. In the present series of 57 cases of cardiac pain, excitement precipitated individual attacks of pain definitely in 48 cases, doubtfully in 4 cases, and failed to do so in 5 cases (Table I). An important

TABLE I

Excitement Precipitating Individual Attacks of Cardiac Pain

Positive, 48; doubtful, 4; negative, 5

DOUBTFUL

—	Physical diagnosis.	Type of pain.	Psychological diagnosis.
1	Essential hypertension.	Spasmodic angina.	Anxiety hysteria.
2	Pernicious anæmia.	Angina of effort.	,, state.
3	Essential hypertension. Old coronary thrombosis.	,, ,,	—
4	Mitral stenosis.	,, innocens.	Anxiety state.

NEGATIVE

1	? Syphilitic.	Angina of effort.	—
2	Mitral stenosis.	,, innocens.	Epilepsy.
3	Essential hypertension. Old coronary thrombosis.	,, of effort.	—
4	—	,, innocens.	Epileptoid psychopathy.
5	Mitral stenosis.	,, ,,	Unclassifiable.

physical link is apparent here between the physical and the psychological sides. It must be remembered, however, that the relationship between the extent of the lesion and the degree of pain depends also on certain other factors.

The rapidity of development of the pain is important as is evident from the severity of the pain produced by even a small coronary thrombosis. A second factor is clearly the amount of living heart muscle peripheral to a coronary lesion. Dead muscle does not suffer. It is possible that this may be a factor that explains the commonness of severe myocardial disease, secondary to coronary atheroma, in patients who during life had no cardiac pain. Cabot (1926) found that 94 cases out of a total of 138 cases with extensive coronary disease gave no history of cardiac pain. Polanco (1936), in a recent paper, finds that only 15 per cent. of 242 cases of extensive coronary disease had cardiac pain. He also found, however, that of the patients with cardiac pain 91 per cent. had severe coronary sclerosis. The deduction seems to be that although coronary disease is essential for the production of angina of effort, it is not the only factor.

A third factor is that referred to above—namely, the variation in sensitivity to stimuli in different individuals. Many patients suffer from angina of effort for years and appear to deteriorate in general health very slightly or not at all. Apparently the coronary lesion in these cases must be slight, and these patients must be particularly reactive to a smaller lesion than would produce symptoms in others. At the other end of the scale are patients whose chief symptom is dyspnœa, who are obviously suffering from a severe degree of left ventricular degeneration, and who complain of only a slight degree of angina of effort, which is definitely subsidiary to the shortness of breath.

That angina of effort is founded upon an organic lesion appears not only from the cases of angina of effort in the present communication, 91 per cent. of whom show definite evidence of cardiovascular disease, but from the fact that in a considerably larger series of cases, in process of publication, a similar result is found.

SPASMODIC ANGINA

The type of pain found in spasmodic angina is characterised by the fact that, although the attack may be induced by exercise, emotion, or exposure to cold, it must run its course when once started, whether the initial stimulus has ceased or not. In addition, these patients very often have a true angina of effort, of the classical proportional type, to a greater or lesser extent. If spasm of the coronaries be postulated as the cause of the spasmodic attack of pain, the possible relationship between the psychical side of the central nervous system on the one hand, and of the mechanism of the production of pain on the other, is clear.

ANGINA INNOCENS

In angina innocens (Bourne 1937) palpitation, undue consciousness of the heart beat, and precordial discomfort are frequent; all of these symptoms can also be felt in normal individuals as the result of severe anger, excitement, or any other intense emotion. Should the central nervous system become hypersensitive, from the presence of a psychosis, it is easy to understand that these temporary physiological symptoms could be exaggerated and rendered less transitory. The pain associated with mitral stenosis is almost without exception of the angina innocens type, having a more or less continuous aching character, being left-sided, not quantitative during exertion, and persisting when exertion has subsided. In the present series of cases it was found that patients with mitral stenosis suffered from this type of pain only. The absence of pain of a classical quantitative type, as occurs in angina of effort, is very striking. The reason why patients with mitral stenosis should suffer from the angina innocens type of pain is worth further analysis. It is interesting that patients with neurocirculatory asthenia, or irritable heart, have a cardiac action very similar in some respects to that found in mitral stenosis. This is a truism to those who have examined any large number of normal but excitable young adults, as, for example, candidates for life insurance and air-pilot certificate. In these normal individuals, excitement produces, temporarily, an identical type of ventricular action to that found in mitral stenosis. Tachycardia is present, a slapping forcible apical impulse, a loud slapping first sound, and some roughening of the latter. The whole picture is so similar superficially to that of early mitral stenosis that many medical officers, previously inexperienced in the examination of this

class of patient, frequently make a diagnosis of mitral stenosis when no such lesion is present. It is suggested that the incomplete ventricular filling per beat, resulting from mitral stenosis, causes an unusually forcible ventricular systole, giving rise to the slapping apical impulse and the high-pitched first sound. If a patient is unusually receptive to stimuli, he may eventually, and possibly as the result of having his attention drawn to his heart during a medical examination, become abnormally heart-conscious. Such a condition of heart-consciousness may become exaggerated, as time goes on, and may be translated into pain.

TYPES OF PAIN IN CARDIAC DISEASE

It is important to realise that two distinct types of pain may be present in organic heart disease. In mitral stenosis the pain is of the angina innocens type, and in coronary disease of the angina of effort type. It is obvious, therefore, that *although the psychological state of the patient may determine whether pain be present or not, or the degree of such pain, the type of pain must be determined by the underlying pathological lesion.*

Clinical Examination

The patients examined belong to the hospital class and were both in-patients and out-patients. In none was there any evidence of cardiac decompensation. The diagnosis of the type of cardiac pain was not accepted unless a full history of the symptoms had been carefully taken and confirmed. Patients who did not definitely fall into one of the recognised groups were excluded from the investigation; the number of these was very small. In all 57 patients with cardiac pain were investigated; 25 were cases of angina of effort, 9 of spasmodic angina, and 23 of angina innocens. In addition to these cases with cardiac pain 33 patients free from cardiac pain but suffering from organic heart disease were examined as controls. All of the patients were examined psychologically. The patients examined are part of a group regularly followed up during the last eight years, and each case has been sufficiently observed to make certain that the type of pain present has remained constant.

METHOD

There have been two main methods of approach—the somatic and the psychological. Each patient has been examined clinically, and a diagnosis as to the type of pain and the physical condition has been arrived at. The examination includes a full and detailed history, clinical examination, six-foot X ray film, and electrocardiogram. Each patient has also been interviewed independently by a psychologist (E. W.), who was not told anything about the patient from the clinical side until after he had made a psychological diagnosis. In the great majority of cases the psychological interview was a single one of two to three hours; in some cases a second or a third such interview took place. The lines of approach were those usually employed in psychiatry. The patients fell into one of the three groups—neurotic, idiopathic, and anatomical. Subdivisions of groups were as follows:—

Neurotic Group.—Anxiety state; anxiety neurosis; anxiety hysteria. Conversion hysteria. Obsessional neurosis. Reactive depression.

Idiopathic Group.—Endogenous depression. Epilepsy.

Anatomical Group.—Senile psychosis (cerebral arteriosclerosis). Mental deficiency. Graves's disease, &c.

Well-balanced Group.

In addition to an opinion as to the somatic and the psychological condition, an attempt was made to decide whether the cardiac pain was severe, moderate, or mild, and also whether the psychological disturbance was severe, moderate, or mild. It was, of course, realised that this opinion as to the degree of the pain and of the psychological disturbance could only be a rough estimate, but it can none the less be believed that the result is not grossly inaccurate.

In both cardiac pain and the control groups the method of psychological interview was identical. A firm attempt was made to remain unbiased. It is acknowledged that this presents some difficulty, owing to the fact that reference to the presenting symptom—namely, that of pain, if it be present, is almost inevitable in the course of such an interview. It is interesting to observe that in the control group were 7 patients who showed evidence of some psychological abnormality, who had no cardiac pain, but who presented somatic symptoms in other areas.

Before the true significance of the figures referring to the incidence of psychological abnormality in any group of individuals can be intelligently appreciated it must be remembered that such psychological abnormality can be discovered in a high percentage of the average population. This fact must be stressed in assessing the results of any investigation such as the present one. As shown by Culpin (1927, 1930), a routine psychological investigation of groups of workers shows, after half an hour's interview or so, a high percentage of individuals with some degree of minor psychosis. His figures are, with regard to factory workers, that 45 to 50 per cent. are normal, 35 to 40 per cent. show some minor psychosis, and 5 to 7 per cent. are psychoneurotics. He found, further, that factory workers did not differ greatly with regard to symptoms from the clerical workers; that such differences as did appear showed the factory workers to be rather less stable than the clerical workers. He found also in "authorities"—i.e., persons who had risen as a result of greater intellectual ability to positions of responsibility—only about 30 per cent. of abnormality.

Results

It was found that the patients with organic heart disease but without cardiac pain fall into somewhat earlier age-groups than those who suffer from the symptom of pain. There were twice as many Jews in the cardiac pain group, 9 being present among 57 patients with pain and 2 in the control group of 33 patients without pain.

The sexes are represented in about an equal frequency in the two groups, there being 37 men and 20 women in the pain group, and 19 men and 14 women in the control group. The sex-incidence of the figures is not susceptible of any very definite conclusions. The considerable preponderance of males is due to the fact that 20 out of 25 cases of angina of effort were in men. In spasmodic angina 8 out of 9 of the cases were in men, but on the other hand, 15 out of 23 of the patients with angina innocens were women. The position in the family is somewhat interesting, as the first and last or only children are usually thought to be more prone to develop psychoneurotic symptoms. In the present series patients who came first or last in the family, or who were single children, showed a slightly higher percentage incidence as regards cardiac pain; the cases in these family positions amounted to 54 per cent. of the cardiac pain patients. On the other hand, 42 per cent. of the cases without cardiac pain occupied this position in the family. No reasonable deductions can be

drawn from the occupational statistics which emerge in the course of the present investigation, for many of the control cases were collected from a poorer class of the population as regards standard of life.

Heredity and environment appear to be to some extent causative factors, as is shown in Table II.

TABLE II

Effect of Heredity and Environment

Cardiac pain.	Probable.	Possible.	None.	Unknown.
With ..	29 (51%)	8 (14%)	18 (32%)	2
Without ..	8 (24%)	8 (24%)	14 (42%)	3

Probable (near relative).—"Insane," "depressed," "suffered from spells of depression," "suffered from anxiety spells," "took to drink," "drinker," "heavy drinker," "drunkard," "of a worrying nature," "hysterical," "highly strung," "nervous," "nervy," "jumpy," "tics."
Possible.—"Flares up," "irritable," "excitable," "quick tempered," "worries a lot," "reserved."
None.—No mental abnormalities in the family.
Unknown.—Illegitimate birth; father died before birth; father or mother died within the first two or three years of the patient's life.

As it is impossible to separate these two, their combined relation to the incidence of psychoneurosis is shown together.

The most striking result of the investigation is seen in the fact that whereas 8 out of 57 patients with cardiac pain are "well-balanced" psychologically, 21 out of 33 are "well-balanced" in the control group of patients with organic heart disease, but without pain. The details are given in Tables III, IV, and V.

TABLE III

Psychological Abnormalities and Types of Cardiac Pain

—	With pain.				Without pain.
	Angina of effort.	Angina innocens.	Spasmodic angina.	Total.	
Anxiety neurosis ..	4	11	1	16	2
,, hysteria ..	6	3	2	11	2
Conversion hysteria ..	1	2	2	5	2
Obsessional neurosis	—	—	2	2	—
Depression—					
Reactive	3	1	—	4	1
Endogenous ..	1	—	1	2	—
Schizophrenia ..	—	1	—	1	—
Epilepsy	—	3	—	3	—
Mental deficiency ..	—	—	—	—	1
Senile psychosis ..	4	—	1	5	2
Well-balanced ..	6	2(?)	—	8	22
Emotional—					
(Graves's disease) ..	—	—	—	—	1

If the incidence of psychological abnormalities in the three main types of chronic cardiac pain are further analysed, it is seen that the incidence is definitely lower in the *angina of effort* group than in the spasmodic angina or the angina innocens group. This is a finding that might have been expected from the quantitative organic character of the pain.

Of these patients 30 per cent. are psychologically normal. The results in the cases with *spasmodic angina* show that the psychological abnormalities are present to a degree of 100 per cent. In most cases the abnormality was pronounced. The patients with *angina innocens* also provided a very striking picture. The results are shown in Table III, where it is seen that all but 2 of such patients were definitely abnormal psychologically. Of these 2 patients one was stated (E. W.) probably to be suffering from some such abnormality, which, however, was too deeply hidden to be easily unearthed without further interview. The second case was a woman who seemed to have an unduly anxious and sensitive mentality, but in whom one interview failed to elicit a psychological diagnosis. Contrasting the results it is interesting to see that the incidence of psychological disorders is fairly evenly distributed in the patients with angina of effort, but in the case of those with angina innocens, anxiety states are present in a very high percentage.

TABLE IV

Incidence of Pain in Psychological Groups

	With cardiac pain.	Without cardiac pain.
Neurotic group	38	6
Idiopathic group ..	6	1
Anatomical group ..	5	4
Well-balanced	8	22

Control cases.—Table III also contrasts the cases with pain with those without, in terms of the various psychological abnormalities. It is seen that 23 out of 33 of the control cases had no psychological disturbance. Table IV shows also the incidence of pain in the four main psychological groups.

TABLE V

—	Angina of effort.	Spasmodic angina.	Angina innocens.	No pain.
Total	25	9	23	33
Psychological disturbance ..	19 (76%)	9 (100%)	21 (90%)	11 (33%)
Increase above normal	(31%)	(55%)	(45%)	No increase.

RELATIONSHIP BETWEEN THE DEGREE OF PSYCHOLOGICAL DISTURBANCE AND OF THE CARDIAC PAIN

An attempt was made to correlate the type of pain with the type of psychological abnormality in terms of degree. In the charts the degree of pain as estimated by G. B. and R. B. S. was plotted on the ordinates and the degree of psychological disturbance as estimated by E. W. on the abscissæ.

It will be seen from the Figure that in angina of effort in only 2 cases is the pain proportionately of a higher grade than the mental disturbance. In angina innocens this predominance of the mental disturbance over the pain in terms of severity is even more pronounced. In spasmodic angina the opposite is seen, for here the degree of pain is definitely more severe than is the degree of mental disturbance.

These charts seem to be open to the interpretation that in both angina of effort and in angina innocens the severity of the mental disturbance was a factor in the production of the pain, and that in the case of spasmodic angina the severe pain might, as regards its production, be independent of the mental disturbance.

SUSCEPTIBILITY OF CARDIAC PAIN PATIENTS TO PAIN ELSEWHERE

If dysmenorrhœa can be taken as a type of pain which is suffered from in proportion to the predisposition of individuals to suffer from pain, it is interesting to observe the incidence of this symptom in patients with cardiac pain.

Of the 13 control cases the percentage complaining of dysmenorrhœa was 15; in all of these control cases the presence and severity of this symptom was inquired into. Of the patients with cardiac pain the symptom was definitely inquired about in 21 cases and was present in 57 per cent. In the remaining cases with cardiac pain dysmenorrhœa was not mentioned by the patient but was not explicitly sought for.

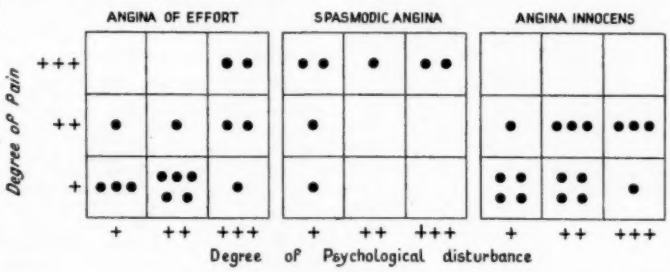
If it be assumed that the symptom was absent in this latter sub-group, it is still seen that the incidence of dysmenorrhœa is higher by 36 per cent. in the cardiac pain cases.

HEREDITY AND ENVIRONMENT

The effect of heredity and early environment on the ultimate frequency of cardiac pain later in life is seen in Table II. In patients without cardiac pain in normal family history was nearly twice as common.

Discussion

The results of the investigation indicate that psychological abnormality occurs in a definitely higher percentage in cardiac pain patients than in control cases. It would appear logical to assume that the patient's psychological make-up is one of the factors responsible for the production of cardiac pain in predisposed individuals. This is further suggested by the fact, to be dealt with in greater detail in Dr. Wittkower's paper, that the onset of cardiac pain in many cases is simultaneous with the occurrence of some severe psychological disturbance.



That the psychological factor is by no means the only one, and, indeed, that it is sometimes a subsidiary or negligible one, is proved by the following cases.

Two patients in the present series suffered with angina of effort, one was found to have an anxiety state and one a considerable degree of hysteria. They both had a mild myxœdema which responded to thyroid extract. In both the cardiac pain disappeared. A third patient, diagnosed "anxiety state," had an angina of effort and pernicious anæmia; with the symptomatic cure of his anæmia his angina of effort has practically disappeared. In a fourth patient a condition of anxiety hysteria was present; he had suffered from no cardiac pain until he developed a coronary thrombosis. The cardiac pain disappeared after this and on his recovery did not recur.

These cases prove definitely that in patients with an abnormal psychology cardiac pain may owe its presence to physical factors; for the removal of or the disappearance of these physical factors is followed by the disappearance of the pain although the abnormal psychological condition persists.

It is only logical to assume that the same may be true of cardiac pain patients in whom there is a physical factor such as coronary atheroma which cannot be removed. In these patients also, even if an abnormal psychological state is present, it must not be assumed that the latter is necessarily the cause of the presence of the anginal pain.

Four divisions can thus be made of cardiac pain patients according to the underlying psychological state.

(1) Well-balanced persons, where the pain is entirely of organic origin.

(2) Neurotics, in whom the pain is entirely of organic origin.

(3) Neurotics, in whom the pain may be superimposed on an organic cardiac disorder.

(4) Neurotics, where the pain may be entirely of psychogenic origin, the organic state being apparently normal.

Definite proof of the essential psychogenic origin of cardiac pain can only be obtained in any particular case by determining, first, that the origin of the pain was associated with some definite psychological state, and that the recrudescence of the pain was associated with a similar psychological crisis or state. It is not sufficient to demonstrate that cardiac pain disappears as the result of psychological treatment, for such treatment may enable the patient to repress a pain which originally had an organic basis.

Conclusions

We have examined from the physical and psychological points of view 57 cases with cardiac pain and 33 cases with organic disease without pain. Evidence of some psychological abnormality was shown in 19 (76 per cent.) out of 25 cases of angina of effort; in 9 (100 per cent.) out of 9 cases of spasmodic angina of effort; in 21 (90 per cent.) of 23 cases of angina innocens; and 11 (33 per cent.) out of 23 patients without pain. If allowance is made for the normal incidence of psychological disturbance in the population according to Culpin's figures, the increase of psychological disturbance above normal in the various types is as follows: In angina of effort 31 per cent., in spasmodic angina 55 per cent., in angina innocens 45 per cent., and in the cases without pain no increase (Table V).

It is clear that there is a higher percentage of psychoneurotic disturbance in cardiac pain patients than in patients with cardiac disease but without pain. Angina of effort is not associated with any particular form of psychological disturbance, but the incidence of anxiety state and anxiety hysteria is unduly high in angina innocens.

The milder types of cardiac pain, angina of effort, and angina innocens appear to be to some extent due to the presence in the patient of a psychoneurotic disturbance. Although the same fact may be true of the patients with spasmodic angina, it is suggested that the severity of the pain may itself be a causative factor in the production of a psychoneurotic state.

The possible psychological mechanism by which the cardiac pain may be produced by the psychological state will be fully discussed in a subsequent paper.

In this communication E. W. is responsible for the diagnosis of the psychological condition present in the patients. For the clinical deductions from the facts available, G. B. and R. B. S. take the chief responsibility though E. W. also helped in this part of the investigation

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A STUDY OF THE ANATOMY OF VERTEBRAL THROMBOSIS

WITH REPORTS ON TWO CASES

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THE two following patients with the retro-olivary syndrome are of particular interest because in each case the symptomatology had clearly indicated an occlusion confined to the posterior inferior cerebellar artery, and yet post-mortem examination showed thrombosis of the entire vertebral artery. That such an extensive occlusion may occur without comparable clinical findings is a known fact, but the explanation for this is not always apparent. The following case reports illustrate very precisely the two main reasons, the one anatomical and the other pathological, for this apparent discrepancy.

Such clear-cut infarctions of the brain stem, when combined with full clinical records, serve yet a further purpose, for they are invaluable aids to the study of structure and function in man. From the types of dissociation of sensory disturbance in the face which occurred in patients suffering from this syndrome, Gerard (1923) and Stopford (1925) were able to deduce that the central arrangement of the divisions of the trigeminal nerve within the brain stem is the reverse of the peripheral. It is certain that similar careful analyses of other clinical findings in these patients will lead to a fuller knowledge of the anatomy of the nerve tracts in the medulla and pons.

There is always, for example, a dissociated sensory disturbance in the contralateral side of the body owing to involvement of the spinothalamic tract, but, curiously, certain of the patients have revealed sparing of the cervical region, and in some rare instances of the thoracic region also. From such clinical observations it is possible to deduce that the fibres in the spinothalamic tract are laminated. A disturbance of sensation in the contralateral side of the face suggests a similar lamination in the quinto-thalamic tract, the central pathway from the spinal nucleus of the trigeminal up to the thalamus. Furthermore, there is the occurrence of an ipsilateral Horner's syndrome in a large percentage of examples of occlusion of the vertebral and its branches, indicating an interruption of descending sympathetic tracts within the brain stem. Unfortunately, the present knowledge of the central pathways of the sympathetic is very meagre and rests largely on data gathered from animal experimentation. In the light of the clinical material presented here, how far can one extend and apply this knowledge to man?

The earliest descriptions of the retro-olivary syndrome were made by Taylor (1871), Senator (1881, 1883), Wallenburg (1895), and Hun (1897), and the examples reported up to 1923 have been reviewed by Gerard (1923) and Stopford (1925). Since that date 24 cases, including the present two, have been reported, as shown in the Table.

Summary of Case Reports of Retro-olivary Syndrome

—	Cases.	Post-mortem.
Ramsbottom and Stopford (1924) ..	1	No.
Richter (1924)	1	Yes.
Foix, Hillemand, and Schalit (1925) ..	1	Yes.
Winther (1927)	1	Yes.
Wilson and Winkelman (1927)	1 1	No. Yes.
Thompson (1929)	4	No.
Merritt and Finland (1930)	1 5	Yes. No.
Anderson, Lockhart, and Souter (1931) ..	1	Yes.
Hall and Eaves (1934)	1	Yes.
Diggle and Stopford (1935)	1	Yes.
Goodhart and Davison (1936)	3	Yes.
Sheehan and Smyth (1937)	2	Yes.
Total	24	13

Sex .. .. 16 male; 8 female.
Average age .. 59½ (between 28 and 76 years).
Side .. .. 13 left; 11 right.

Of these, only 13 came to autopsy and were studied histologically but both verified and unverified examples have been included in the Table, for it must always happen that where death supervenes rapidly, the patients will rarely have been so carefully examined as those that recover. Indeed, in many instances, a proper sensory examination is all but impossible.

FIRST CASE

A warehouseman aged 55, married, was admitted as an urgency into the Manchester Royal Infirmary on June 5th, 1935. He complained of weakness of the left arm and that he was unable to swallow. The symptoms had developed in the following manner. He was in his usual state of health until 7.30 A.M. on June 4th, 1935, when he was suddenly seized with a sensation of pins and needles down the right side of his body and almost at the same moment he noticed that he was unable to swallow his saliva. His left arm became weak. He was perfectly certain that at no time was there the least impairment of consciousness. He remained in this state until his admission into hospital at 8.30 P.M. on June 5th under the care of Dr. A. H. Holmes.

Previous history.—In June, 1933, he first became aware of undue breathlessness on exertion, and in February, 1934, he was admitted to the infirmary under the care of Dr. Crighton Bramwell for investigation. The clinical picture was one of cardiovascular degeneration. Between his discharge from hospital in February, 1934, and his readmission on June 5th, 1935, his general condition remained stationary.

General examination (on readmission).—No characteristic attitude was adopted. The patient lay in dorsal decubitus. The breathing was shallow and much impeded by mucus and saliva which he was unable to expectorate. Cardiovascular system: pulse strong and regular; the rate 88; the blood pressure was 130/90 mm. Hg; there was no sign of cardiac muscle failure. Respiratory system: there were numerous râles at the lung bases.

Examination of nervous system.—Cranial nerves: the left pupil was smaller than the right and the left palpebral fissure was narrowed. The optic nerve heads were normal, and there were no retinal changes. The fields of vision were full by the confrontation test. The ocular movements were full but coarse nystagmus was elicited on the

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patient looking to the right and slight nystagmus on looking to the left. There was no sensory loss whatever over the face but loss of common sensation on the left side of the tongue almost to the midline. As far as could be ascertained, the appreciation of taste was intact on both sides of the tongue. Hearing was intact and there was no weakness in the facial or masticatory muscles. The left palate was immobile and the uvula was drawn over to the right side. There was complete aphonia but no aphasia. The 11th and 12th cranial nerves were unaffected.

Motor system: Except for a relative weakness of the left arm and leg there was no paralysis anywhere. The tendon jerks were all present and equal. The plantar responses were both flexor. There was considerable hypotonicity of the left arm and leg as compared with the right.

Sensation: There was complete analgesia down the right half of the body with the exception of the area of supply of the 5th cranial nerve. In this analgesic area, light touch was immediately appreciated.

Coördination: There was gross incoördination of the left arm and leg. In performing the finger-nose test, the patient was fully 2 feet wide of the mark, the deviation being always towards the patient's left side.

Clinical diagnosis.—Posterior inferior cerebellar thrombosis.

Progress.—On the morning after admission the patient's condition had greatly deteriorated. Cyanosis was pronounced and the breathing was greatly embarrassed by the accumulation of secretions. He lingered throughout the day and died at 6 o'clock the same evening, 36 hours after the onset of symptoms.

Post-mortem examination (June 7th, Dr. W. Susman).—The brain was congested throughout. The left vertebral artery was thrombosed with firm ante-mortem clot from the point where it passed on to the ventral aspect of the medulla to the point of fusion at the basilar artery. The clot extended into the left posterior inferior cerebellar artery for a considerable distance, but 2 c.cm. before this vessel penetrated the inferior surface of the cerebellum the lumen of the artery was patent. The left anterior spinal was unaffected. The left posterior spinal could not be identified. The right vertebral and basilar arteries were healthy. The heart was enlarged and there were fatty changes but no evidence of valvular disease. The aorta revealed no serious atheromatous changes. The lungs showed hypostatic pneumonia.

Histology.—Sections were made at all levels of the medulla oblongata and stained with hæmalum and eosin, Nissl and the Loyez method for myelin sheaths. As death occurred within 36 hours of the onset of symptoms, no tract degeneration studies were possible. In sections through the lower part of the medulla the lesion is not visible. At the level of the sensory decussation the area of infarction appears on the left side, and is restricted to the dorsal aspects of the medulla, involving the nucleus and fasciculus cuneatus and the nucleus gracilis. Sections through the lower part of the inferior olivary body (Fig. 1) show the lesion to occupy the entire dorsolateral aspects of the medulla but leaving the mesial and ventral aspects intact. In a ventral direction it extends to involve the dorsal half of the olive and its connexions. Dorsally, the ventral part of the restiform body and the nucleus ambiguus are implicated, but the nucleus solitarius and the descending tract of the vestibular nerve have escaped. Laterally, there is a thin rim of brain tissue forming the outer wall for the lesion, and in this area most of the nerve-fibres show signs of degeneration, and there is much vacuolation. The spinal nucleus and tract which lie within the zone of infarction are considerably altered, the cells having undergone severe chromatolysis, and many of the nuclei are excentrically placed. The emerging and entering fibres of the vagus nerve lie in the centre of the lesion. Mesially, the pyramidal tract, mesial fillet, posterior longitudinal bundle, hypoglossal and dorsal vagal nuclei are intact. In the mid-olivary sections, the infarcted area is diminished in size and is confined to the central part of the medulla lying immediately dorsal to the olive. It involves the nucleus ambiguus and the emerging and entering fibres of the vagus only, leaving the spinal nucleus and tract of the 5th nerve, the spinocerebellar tracts, and the restiform body intact. At the most oral limit of the medulla, at the entrance of the 8th cranial nerve, the lesion has entirely disappeared.

This case is of particular interest because it reveals an anatomical vertebral distribution of extremely limited extent. It is probable that collateral circulation at the periphery of the lesion accounted partly for this, but the collateral circulation between the branches of the vertebrals and basilar is very small indeed. Now according to Stopford (1916, 1917) the

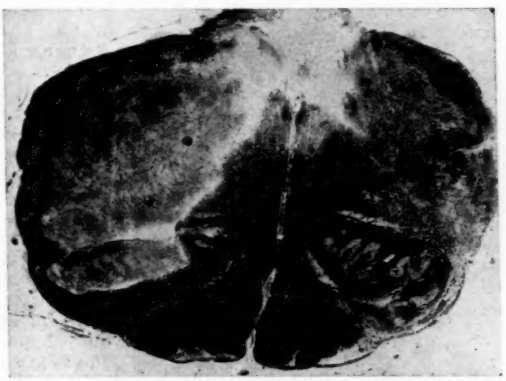

FIG. 1.—Section through the lower olivary region of the medulla of Case 1 showing the greatest extent of the lesion.

cephalic end of the medulla is supplied by bulbar branches from the vertebral, but in 19 per cent. of cases there is a low junction of the two vertebrals, and the basilar instead of the vertebral supplies the most central parts of the medulla at this level—namely, the pyramid, mesial fillet, and hypoglossal nucleus. Such a low junction of the two vessels was present in this first case reported here. The basilar artery was formed by the junction of the two vessels at the level of the middle of the olive. The report serves therefore as a clinical example of the occasional limited anatomical distribution of the vertebral artery, and it emphasises again the importance of recalling the anatomical variations in the bulbar distribution of the vertebral artery and its branches.

Of the 24 recorded examples since 1923, 16 showed a Horner's syndrome in the ipsilateral eye, and this was well demonstrated in the above report. The myosis is apparently the most frequent sign, ptosis is less often seen and enophthalmos the least. There is never any indication of Horner's syndrome on the opposite side. Other signs of sympathetic palsy which have occasionally been observed are vasodilatation and the absence of sweating of the skin on the ipsilateral side of the body. Many observers have indicated the presence of the latter by reporting excessive sweating on the contralateral side of the body, a recognised compensatory mechanism.

The ipsilateral type of sympathetic palsy proves to be very significant in the consideration of the central pathways for the sympathetic. It is clear at once that these pathways do not cross below the level of the pons. Furthermore, it appears that the central sympathetic pathways lie dorsolateral in the medulla, probably close and medial to the spinothalamic tract.

Russel (1931) has reported a case of infarction in the upper part of the pons and lower levels of the mid-brain. The lesion, which was left sided, involved

the superior cerebellar peduncle and extended ventrally to implicate the spinothalamic tract, but the central grey matter around the upper part of the 4th ventricle and the nucleus and fibres of the third nerve remained intact, yet there was evidence of a left Horner's syndrome. The findings in this patient indicate that the central sympathetic pathways for the eye do not cross below the upper level of the midbrain in man. This is in disagreement with the experimental results (Karplus and Kriedl 1909, 1910, 1911), which suggest that a sympathetic pathway arising in the frontal cortex relays in the hypothalamus and passes down the ipsilateral side of the brain stem, crossing only in the first thoracic level of the cord.

FIG. 2.—Section through the mid-olivary region of the medulla of Case 2 showing the greatest extent of the lesion.

SECOND CASE

A grocer aged 43, single, awoke at 7 o'clock on the morning of Nov. 27th, 1935, to find himself totally unable to swallow. He vomited almost immediately and he noticed that he could only speak in a whisper. He did not remain in bed but found difficulty in standing because of dizziness. This feeling of unsteadiness, he said, entirely disappeared if he lay still, but movement of any kind brought it on. During the course of the day he became aware that the right side of his body was numb. He volunteered the information that he could burn his fingers with a cigarette without causing any pain. At the same time he noticed that the left side of his face above the eye felt quite numb. His sister, who lived with him and who was an unusually observant witness, had actually tested these complaints herself, and had found that over these areas he could neither feel pain nor tell the difference between hot and cold.

The patient's symptoms abated somewhat during the succeeding 24 hours, but on Nov. 30th his left eye became inflamed and he was admitted to the Manchester Royal Eye Hospital. He seemed to be progressing favourably until Dec. 13th when the left side of his face became suddenly paralysed and his difficulty in swallowing became very severe. Liquids gave him particular trouble. On Dec. 14th he was transferred to the Manchester Royal Infirmary under the care of Dr. Holmes.

Previous history.—The patient had enjoyed good health up to a year previous but latterly he noticed that he was becoming unduly tired and irritable, and suffered from occasional temporary diplopia.

General examination (on admission Dec. 15th).—A heavily built man, intelligent and perfectly orientated in time and space but in great distress from his inability to swallow or cough. He did not adopt any characteristic position. He had complete aphonia. Temperature 99·5° F. Cardiovascular system: pulse strong and regular, rate 104; the blood pressure was 170/120 mm. Hg.; heart clinically enlarged; no signs of cardiac muscle failure. Respiratory system: lungs healthy; respirations 32.

Examination of nervous system.—Cranial nerves: There was no anosmia. The right fundus oculi was normal, no papilloedema. It was impossible to examine the left eye as he had a severe suppurative keratitis with great chemosis, and œdema of the eyelids. The external ocular movements were full. There was slight nystagmus on looking to the right. The reactions of the right pupil were quite normal. There was complete anæsthesia on the left side of the face to all forms of sensation over the area of supply of the first division and hypalgesia over the area of supply of the second division of the trigeminal nerve. There was a complete facial paralysis on the left side. Hearing was normal on both sides. It was very difficult to be certain of the sense of taste but it appeared to be very deficient on the left side of the tongue. On attempting to phonate, the palate was drawn over to the right side. The 11th and 12th cranial nerves were unaffected.

Motor system: The power on the right side of the body seemed quite normal. On the left side there was greatly diminished power in both limbs. There was marked hypotonia of the upper and lower extremities on the left side. All the tendon reflexes in the arm were diminished on the left side as compared with the right. The knee- and ankle-jerks were present and equal on both sides. The plantar response was flexor on the right, extensor on the left. There was a tendency to ankle-clonus on the left side. The superficial abdominal reflexes were present on both sides but much brisker on the right side

Sensation: There was total analgesia on the right side of the body with the conspicuous exception of the area supplied by the cervical plexus. In the analgesic area there was definite impairment of temperature discrimination but light touch and vibration were correctly appreciated.

Coördination: There was gross ataxia of the left arm and leg.

Clinical diagnosis.—Posterior inferior cerebellar thrombosis.

Progress.—On the day after admission there was a sudden increase in the paresis on the left side of the body and the patient became drowsy. On the following day he had lapsed into coma but could still move the right arm and leg. Temperature 103° F., pulse-rate 112, respirations 36. The depth of the coma increased and he died at 10 P.M. on Dec. 18th, 22 days after the onset of the symptoms.

Post-mortem examination (Dec. 19th, Dr. Susman).—The brain showed slight thinning of the convolutions. The arteries of the circle of Willis showed very considerable atheroma. Both vertebral arteries were thrombosed, containing large firm clots. The heart showed some hypertrophy and dilatation. A considerable degree of patchy fibrosis was present in the myocardium. The coronary arteries showed considerable atheroma throughout their length. The lungs contained many bronchopneumonic patches. The kidneys were both enlarged, and their surfaces were studded with cysts 3 mm. to 3 cm. in diameter. On section large areas of cortex were completely destroyed by the cyst formation.

Histology.—Sections were made at all levels of the medulla oblongata and pons and stained by the Weigert-Pal and Marchi technique. The Marchi preparations, probably owing to faulty technique, failed to show any tract degeneration in spite of the three weeks' history of the illness. The Weigert-Pal preparations, however, enabled the area of infarction to be delimited accurately. In sections through the motor and sensory decussations in the medulla no lesion is visible. Immediately above the sensory decussations a sharply demarcated area of infarction appears on the left side. It is a small wedge-shaped lesion with its base at the periphery and the apex extending inwards between the inferior olive ventrally and the spinal nucleus of the 5th nerve dorsally. It involves the spinothalamic, rubrospinal, and ventral spinocerebellar tracts completely. The olive and spinal nucleus of the 5th nerve are spared at this level. At a slightly higher level, in sections through the emerging vagal fibres, the infarcted area is much larger, extending ventrally to involve part of the inferior olive, dorsally to involve the spinal nucleus

and tract of the 5th nerve, and inwards to include the nucleus ambiguus and part of the nucleus solitarius. The emerging and entering fibres of the vagus nerve lie in the centre of the lesion. Mesially, the pyramidal tract, mesial fillet, posterior longitudinal bundle, hypoglossal, and dorsal vagal nuclei are intact (Fig. 2). In sections through the upper part of the medulla, at the entrance of the 8th cranial nerve, the lesion becomes small again, and finally disappears before the commencement of the pons. In none of the sections of the medulla or pons is there any lesion visible on the right side.

This is unquestionably an example of a spreading lesion, thrombosis starting in the posterior inferior cerebellar artery, spreading to the vertebral and later to the other vertebral. The post-mortem findings show only the result of the primary obstruction to the posterior inferior cerebellar vessel. This happens frequently in such cases and explains many of the confusing reports that reveal otherwise inexplicable discrepancy between the clinical signs and the post-mortem findings. The clinical history of this case bears out this suggestion, and it is true of a large majority of cases in which the onset is sudden, usually without loss of consciousness, but there follows a period during which there is a slow but steady increase in the number and severity of the symptoms.

DISTRIBUTION OF ANÆSTHESIA

There are two points of special interest in the sensory loss of Case 2, firstly the complete anæsthesia on the left side of the face over the area of supply of the first division of the trigeminal, with more or less sparing of the maxillary and mandibular divisions, and secondly, absence of any sensory impairment in the area supplied by the cervical plexus on the right side of the body.

The impairment of sensation in the 24 recorded examples of retro-olivary syndrome since 1923 have been grouped as follows in the manner suggested by Stopford (1925):—

GROUP 1: *Pain and temperature impairment in ipsilateral side of the face.*—Ramsbottom and Stopford (1924); Richter (1924); Winther (1927); Wilson and Winkelman (1927) (Case 2); Thompson (1929) (Cases 1–4); Merritt and Finland (1930) (Cases 1–3); Goodhart and Davison (1936) (Case 1); Sheehan and Smyth (1937) (Case 2).

GROUP 2: *Pain and temperature impairment in contralateral side of the face.*—Hall and Eaves (1934).

GROUP 3: *Pain and temperature impairment in both sides of face.*—Merritt and Finland (1930) (Cases 5 and 6); Goodhart and Davison (1936) (Case 2).

The remainder presented no sensory impairment in the face.

It will be seen that the great majority showed impairment or loss of sensibility over the ipsilateral trigeminal area. Rarely was sensibility disturbed on the opposite side of the face. The explanation is clearly that the quintothalamic tract lies deeper and is therefore more often spared than the spinal nucleus and tract of the 5th nerve which is placed more peripherally (Stopford 1925). This is to be expected from the wedge-shaped appearance of the lesion, projecting inwards from the surface of the medulla. In 7 instances no sensory loss was found in the area of distribution of either trigeminal, for in some instances the spinal nucleus and tract of the 5th nerve lie outside the area supplied by the posterior inferior cerebellar artery (Stopford 1925). It is necessary to emphasise, however, that more patients would probably show some slight impairment of sensation if a complete sensory examination were always possible, for it is essential that the sensation on each side of the face be compared carefully with that in the arm and leg of the same side as the lesion, for it is only in these latter parts that it is fair to assume that the sensation is normal for the particular individual under observation.

Now in Case 2 reported here and in 3 other examples of the series, the impairment of sensation on the face was confined to the two upper divisions of the trigeminal, and the first division was usually more deeply affected than the second. As it is the cephalic extremity of the spinal nucleus and tract of the 5th nerve that frequently escapes after occlusion of the posterior inferior cerebellar artery, these cases add further confirmation to the view expressed by Gerard (1923) and Stopford (1925) that the central arrangement of the three divisions of the trigeminal nerve is the reverse of the peripheral. There is no support for the opposing theory, as enunciated by Woods (1913), of a segmental distribution of the spinal root nucleus, so that each level of the nucleus passing orally receives fibres from a concentric band of skin nearer to the mouth. Indeed, this theory has been founded largely on the clinical findings in patients suffering from syringobulbia, many of which have not been verified histologically, and where this has been done a cavity has been found, often very irregular in shape and interrupted by bridges of normal tissue, and the evidence is hardly admissible.

The sparing from sensory loss over the cervical region on the contralateral side of the body has been previously noted by Thompson (1929), and in the patient of Anderson, Lockhart, and Souter (1931) the impairment in sensation on the contralateral side extended up only as far as the umbilicus. No interpretation which is based on a gradual crossing of the fibres from the cervical region will explain this additional sparing in the thoracic region. Sparing, sometimes in the cervical and occasionally in the thoracic region also, can only be explained by a lamination of the fibres in the spinothalamic tract, those from the leg area lying most superficially, those from the trunk and arm at a deeper plane, and those from the cervical region deepest of all. Such an arrangement in the cord is supported by all the evidence gathered from the results of chordotomy, and it seems to hold for the termination of the fibres in the ventral nucleus of the thalamus. It is reasonable therefore to presume its existence in the medulla. A lesion extending from the periphery inwards to a variable extent would result in involvement of the superficial fibres of the spinothalamic tract in almost all cases, the deepest fibres less often, hence the sparing of the cervical region and occasionally of the thoracic region.

It is possible to argue from the two instances reported by Müller (1906), in both of which the responses to pain and temperature were completely lost in the *contralateral* side over the upper division of the trigeminal, whilst in the maxillary and mandibular divisions these sensations were only slightly impaired, that there exists a similar lamination of the fibres in the quintothalamic tract. Thus the fibres from the lower part of the spinal nucleus of the 5th nerve (related to the ophthalmic division of the trigeminal) would be the most superficially placed, the fibres from the middle part of the nucleus (related to the maxillary division of the 5th nerve) on a deeper plane, and the fibres from the upper part of the nucleus (related to the mandibular division of the 5th) occupying a still deeper position. Such an arrangement is indicated in the first figure of Stopford's paper (1925) and is represented

diagrammatically here in Fig. 3, in connexion with a similar lamination of the spinothalamic tracts.

In the patient of Hall and Eaves (1934), on the contralateral side, the lower divisions of the trigeminal were involved to a greater extent than the upper division. It is the only instance of such an arrangement, which would be opposed to a lamination of the quintothalamic tract as assumed above. From the report, however, the lesion appears to have been unusual in shape and to have extended upwards into the pons. Below, it divided into two discrete

Schema of Lamination of Fibres for Pain and Temperature Impulses in the Spinothalamic and Quintothalamic Tracts

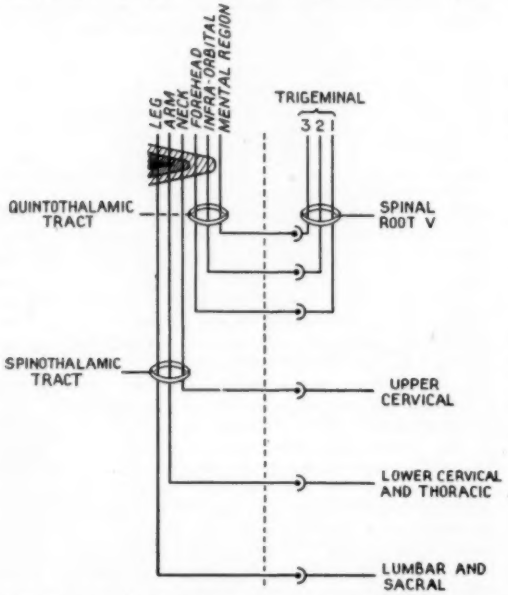

FIG. 3.—A wedge-shaped lesion in the medulla (shown diagrammatically) may thus involve only the leg, trunk, and arm areas, or project further inwards to implicate successively the neck, forehead, infra-orbital and mental regions.

areas of infarction, one of which was small and rather more centrally placed, producing slight involvement of the mesial fillet, as revealed by impairment of stereognosis in the right hand and slight impairment of the sense of position in the right foot. A centrally placed lesion such as this might readily implicate only the deeper lying fibres in the quintothalamic tract and thus account for the unusual distribution of sensory impairment in the face.

In 7 of the instances reviewed here there was evidence that light touch had also been affected in the area of supply of the trigeminal, although it was never completely lost as were the modalities of pain and temperature. Such an impairment of tactile sensibility was revealed in the ophthalmic division in Case 2 of the present report. In the review by Stopford (1925) it was pointed out that in most of these cases the lesion has extended into the pons, as deduced from the concomitant facial palsy. The chief sensory nucleus of the 5th nerve in the pons might be implicated and account for the impairment of tactile sensibility. From such examples, therefore, it would be impossible to deduce anything definite in regard to any possible pathways for the recognition of light touch via the spinal nucleus of the 5th. On these grounds, Case 2 of the present report and the instances of Merritt and Finland (1930) and of Goodhart and Davison (1936), which all showed some involvement of tactile sensibility in the face, must be excluded as inconclusive. Two reports in the present series, those of Richter (1924) and Winther (1927), stand out in contrast however. In both of these the lesion was confined to the posterior inferior cerebellar artery (they were both examples of embolus) and autopsy showed no pontine lesion whatever. Yet in both, tactile sensibility was impaired in the ipsilateral trigeminal supply. There is some positive evidence therefore that fibres conveying tactile sensation descend in the spinal tract of the 5th nerve but for a shorter course than those for pain and temperature. Such an arrangement would offer an explanation for the impairment in tactile sensibility confined often to the first and sometimes to the second division of the 5th when pain and temperature sensibilities are lost over the entire trigeminal supply. Windle (1926) has offered some anatomical evidence in support of such an arrangement.

Before concluding, special mention must be made of the paper by Foix, Hillemand, and Schalit (1925). They believe that many of the reported examples of posterior inferior cerebellar syndrome are due in fact to occlusion of the "artery of the lateral sulcus of the medulla." It seems certain that the artery referred to by them is one of the larger of the branches described by Stopford as arising near the origin of the basilar, or commonly from the anterior inferior cerebellar and distributed occasionally to the upper levels of the retro-olivary region of the medulla. Their report does serve, however, to emphasise the difficulty of recognising clinically an occlusion limited to the posterior inferior cerebellar artery. The distinction between occlusion of the posterior inferior cerebellar (Wallenburg's syndrome) and that of the vertebral artery (Babinski-Nageotte syndrome) is not an easy one. Where there are additional signs of pyramidal involvement the diagnosis is certainly vertebral, but the absence of such evidence is no indication that the occlusion is confined to the posterior inferior cerebellar vessel. On account of this difficulty, no sharp line of demarcation has been drawn between these two conditions in the present series.

Our thanks are due to Prof. J. S. B. Stopford for many valuable suggestions.

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BULGARIAN TREATMENT OF POST-ENCEPHALITIC PARKINSONISM

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The treatment of post-encephalitic parkinsonism described as the Bulgarian method is not generally known in Great Britain nor as far as we have been able to ascertain has anything been published here or in America. Yet it is being used on the Continent, and especially in Italy, on a national scale. As recently as August, 1937, a hospital in Germany has been opened to serve exclusively as a centre for this treatment. In Austria, France, and Belgium the method is followed with considerable interest.

In the last two years it has seemed of growing importance for us to investigate the numerous reports published on the Continent. In March, 1934, at the Société Médicale des Hôpitaux, it was stated that the Roemer or Kleemann high-atropine method was the best treatment of post-encephalitic disturbances, whereas later Panegrossi (1935) in Rome became assured that the Bulgarian treatment, as perfected and organised in Italy, had a definite advantage over the high-dose atropine method.

The history of this empirical treatment is connected with a hitherto obscure apothecary, Ivan Raeff, living in a small Bulgarian village. By his activity it has spread from its native Bulgaria to other countries, and finally, by the efforts and the bounty of the Queen of Italy, the Italian medical schools began to investigate its value. Its administration slowly lost the original form, various workers having reduced it to a scientific basis.

PHARMACOLOGY

Examinations by di Mattei (1935) of Pavia and Tocco (1936) of Messina proved that the basis of the treatment is a belladonna root very different, however, morphologically from other belladonna roots. Panegrossi described it as a "root of the solanaceae (mainly belladonna) from Bulgaria."

The fact is well known that the alkaloids of the solanaceæ group exert a very favourable influence and in some cases cause a dramatic recovery in patients suffering from post-encephalitic parkinsonism.

In comparing the results of the Bulgarian treatment with those obtained, for instance, by Roemer (1932a) or by Marinesco and Façon (1933), it may appear on the surface that there is not much difference as regards the drug and the results obtained. One may also bear in mind the experiences with the high-dose atropine treatment published by Anna Kleemann (1929c), Polstorff (1932), Lisak (1932), and others, or the reports by Hill and Worster-Drought (1929), Stalker (1929), Carmichael and Green (1928), with various preparations of stramonium, hyoscine, and proprietary makes of belladonna alkaloids. And yet there is a remarkable difference between those reports and those on the Bulgarian treatment. After repeated visits to the Italian clinics and careful investigations in Italy and elsewhere, we have to agree with the leading clinicians who have dealt with this problem that up to the present no treatment of the parkinsonian syndrome has given such satisfactory results as those obtained from the Bulgarian treatment.

The problem as to why the decoction of the Bulgarian belladonna root is more efficacious than the other drugs or the pure alkaloid cannot yet be said to have been solved. It is, however, certain that the basis of the Bulgarian treatment is not atropine as such. We have confirmed the research work and the conclusions of Tocco (1936) in this connexion.

Expt. 1.—Five grammes of the Bulgarian root, finely pulverised, were macerated in 100 c.cm. of distilled water for five hours at a room temperature of 15°–17° C., in conformity with the recipe of the Italian clinics. A drop of the filtered liquid thus obtained was instilled in a cat's eye and caused intense mydriasis after 15–20 minutes, lasting for some hours.

Expt. 2.—The 5 per cent. decoction of the Bulgarian belladonna root in white wine was filtered after 12 hours. Several drops of this decoction were instilled in a cat's eye and in spite of repeated instillations no reaction could be obtained.

Expt. 3.—The decoction was slowly evaporated on a water bath at a low temperature until its volume was reduced to one-half. Several instillations of this concentrated decoction in a cat's eye produced no result.

The results of these experiments support the clinical observations that the visible effect of the Bulgarian treatment is different from that of other forms of treatment. The question whether it is possible that the method of preparing the decoction gives rise to intermediate products of the atropine or the other alkaloids of the Bulgarian root remains unsolved. It seems that the difference between the methods of treatment is essentially due to: (*a*) the potentially stronger action of the decoction of the whole root; (*b*) the possible presence of intermediate products of the alkaloidal group; (*c*) buffer substances that serve to lower the toxicity, equalise absorption, and prolong the effect of the active principles.

ADVANTAGES

From the point of view of exact science, one would certainly prefer the measurable doses of known active principles, and while some workers are still engaged in establishing this basis for the Bulgarian treatment also, others tend to attach more value to the drug in toto which—empirically, it may be—accounts for that greater tolerance, slower absorption, and thereby more prolonged action combined with lower toxicity.

These points may be proved by the following considerations:

(*a*) The pharmacopœias give the maximum dose of leaf powder as 0·2 gramme; of the fluid extract from root, up to 1 minim, and of the tincture, up to 30 minims. The 5 per cent. decoction used in the Bulgarian treatment is given in doses of 40–90 c.cm. a day, corresponding to an intake of 2·0–4·5 g. of root, yet the toxicity is very low. Ferrannini (1935) tried to establish the toxic dose on dogs by giving up to 100 c.cm. of the 5 per cent. decoction at a time, but as no appreciable toxic effect could be observed he stopped the experiment, since 100 c.cm. is equivalent to more than ten times the maximum human dose.

(*b*) It has been proved by the experiments described above that the treatment cannot be exclusively an action of the atropine content of the decoction.

(*c*) The treatment can be interrupted for days and many cases have been recorded where none has been given for weeks without the reappearance of the symptoms.

(*d*) The results of the treatment can be expected, according to our own experience and that reported by many clinicians, to appear more quickly and with greater efficiency than those obtained with other alkaloids.

The disadvantage of the high-dose atropine treatment on the other hand seems to be the long time

needed for the patient to become accustomed to the drug. This calls for careful control, since tolerance is difficult to establish, the action of atropine being unstable and transitory, nor does it seem possible to suspend the treatment for a single day without giving rise to severe symptoms of regression. Moreover a certain zone of danger has to be considered, as Siegmund (1935) recently reported cases of gastro-intestinal atony terminating in paralytic ileus. He holds that the long-continued intake of atropine is capable of inducing alterations of the neuro-vegetative system which, disturbing the action of the parasympathetic system, lower the motility and tonus in given sections of the gastro-intestinal tract.

He reports five cases where the post-mortem examination showed dilatation from the anus to the ascending colon, formation of stercoral ulcers with perforation, and general peritonitis. In a sixth case, the patient died suddenly after three weeks' treatment with atropine up to 0·06 g. a day, with signs of acute dilatation of the stomach. The post-mortem examination showed an enormous dilatation of the stomach which filled the whole abdominal cavity to the symphysis pubis, a dilatation of the duodenum, while the colon was less affected.

This case started a systematic series of radiological examinations in patients treated with atropine. Dr. Fehsenmeier (1935) of the Burgerhospital, Stuttgart, reported seven cases of parkinsonian patients treated with atropine in high doses as showing excessive dilatation and ectasis of the stomach mostly combined with considerable dilatation of the whole colon or parts of it.

On the other hand, the phenomena of intolerance observed with the Bulgarian treatment are, according to all authorities, very slight: a feeling of vertigo, dryness of the mouth, and mydriasis, whereas there is never insomnia, hallucinations, or phenomena of delirium nor any alterations such as are observed by Roemer with the pure atropine treatment. The radiological examinations which were systematically carried out after Siegmund's report became known showed that only in a small percentage was there a lowered tonus of the digestive tract and in the majority of cases no abnormality could be observed. We may add that the experience of the Italian clinicians was gained from well over 3000 cases, certainly an abundance of clinical evidence.

The general effects of the Bulgarian treatment on the symptoms may be summarised as follows:

(*a*) The muscular hypertony, although in a variable measure, is undoubtedly most brilliantly influenced.

(*b*) The involuntary movements . . . the results are excellent in most cases, except in the oculogyral crises, which seem to yield only to prolonged treatment. In the tremors, an almost constant symptom of the parkinsonian state, the results are in some cases very good but in the majority it never wholly disappears and is much influenced by emotion.

(*c*) The reports regarding the disturbances in speech are not unanimous, while symptoms such as salivation, excessive perspiration, and weeping crises are mostly easily overcome.

(*d*) On mental anomalies, severe in so many patients, the treatment has had very little effect except for a few notable results. We may quote Mann and Gopcevich (1935) who deplore the fact that one patient completely relieved of his physical immobility ended up in the confines of a prison for some agile felony. On the other hand, many of those patients who exhibit lack of initiative, slowness of concentration and of mental perception, besides their physical impediments, show a remarkable impetus towards normal after the administration of the Bulgarian treatment. It seems as if there is in reality a parallelism between the bodily and the mental changes.

PREPARATION AND DOSAGE

The preparation of the decoction has been influenced by the original recipe of Raeff.

Thirty grammes of the root and rhizome of belladonna are macerated in 600 c.cm. of dry white wine containing from 10 to 12 per cent. of alcohol. (White wine is chosen on account of its smaller tannin content, avoiding a heavy precipitation.) The maceration takes 5–6 hours and the liquid is then boiled for about 14 minutes, after which it is filtered through cotton-wool and the decoction so obtained stored in refrigerators. Various problems as to the length of maceration, the time of boiling which effects a reduction in volume and an increase in alkaloid content, will be dealt with at a later date.

The dosage is controlled entirely by clinical observations of the physician, and it is quite certain that it cannot be given without exercising the greatest care.

Panegrossi in Rome starts with an extremely small dose, 2–3 c.cm. being given at 11 P.M. This dose is increased every day by 1–3 c.cm. until 20 c.cm. are reached. The dose is then divided, half being given at 11 A.M. and half at 11 P.M. Again each dose is increased and finally decreased if necessary until an optimum dose is reached. We should say that 60 c.cm. a day of the decoction for subjects otherwise healthy and without any hepatic, renal, or other gross organic disease can be safely given. In very serious cases the dose can be increased to 90 c.cm. without any ill effect. In addition, dietetic and physiotherapeutic methods are used to enhance the effects of the decoction. The diet should be chiefly lacto-vegetarian, with no alcohol, coffee, or spices; tobacco is also forbidden.

The decoction we have used has been prepared from roots purchased in Bulgaria. Enough material to treat 100 patients for a year would cost no more than £7.

CASES TREATED

So far we ourselves have treated only two patients, both of whom have had various treatments previously.

CASE 1

A married man aged 54; encephalitis lethargica in 1922, parkinsonian symptoms appearing shortly afterwards. He first received treatment with atropine and as no appreciable result was obtained he discarded that to continue with hyoscine. Under this his condition became stationary.

At the start of the Bulgarian treatment, the hypertony and tremor were extremely severe and salivation was very troublesome. He was unable to feed or dress himself. His speech was at times scarcely audible and spasm of his masseters interfered with his feeding. There was anteropulsion and a mask-like face. The treatment began at 5 c.cm. a day and reached a daily maximum of 90 c.cm. when he complained of vertigo. His optimum dose was 60 c.cm. The general condition improved considerably within eight days. The muscular rigidity decreased slowly within five weeks so that he was able to dress and feed himself and he could walk over half a mile after having been nearly four months in bed. His face lost the mask-like expression and he was able to join in his family life more than ever before since his illness. An especially notable feature was the decrease of his tremor, and his palpebral spasm, which often had lasted for 24 hours, disappeared after the first two weeks. No other toxic symptom was noted than the vertigo, which disappeared on lowering the dose.

CASE 2

A married man aged 65; history of 20 years of parkinsonism. On starting the Bulgarian treatment, he had been receiving 20 minims of tincture of belladonna daily for the last year. His rigidity was severe and his salivation so

great in spite of the belladonna that he was constantly soaked. Tremor and anteropulsion were present; polysyllabia, palilalia, and dysarthria were pronounced so that his speech at times was unintelligible. He was often in a state of mental confusion. The Bulgarian treatment started with 5 c.cm. and went up to 15 c.cm. a day during the first week. His progress was almost incredibly good. His expression became normal. The salivation disappeared. He could dress and feed himself and the disappearance of the speech abnormalities was the most interesting feature. The treatment had to be interrupted on account of his mental state as he made attempts to escape from his relations' house and behaved rather inconveniently.

Considering the last patient's age and the duration of his illness, as well as the failure of previous treatments with various alkaloids, the relief of his symptoms was unlooked-for and surprising.

SUMMARY

From the Italian and other foreign reports and from our own observations, the Bulgarian treatment cannot but be classified as a symptomatic treatment even though it may, in many cases, be suspended with impunity for variable lengths of time. In a considerable percentage of cases the results are definitely better than those which have been achieved in the past. There is less danger of complications. The cost of the treatment is extremely low. The scope for further research work is clearly wide, both pharmacologically and clinically.

We have to thank Dr. A. Gandellini of the Civic Hospital, Legnano, and Prof. G. Panegrossi of Rome for their courtesy in offering us every facility for investigating their methods of carrying out the Bulgarian treatment.

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Rochdale, Lancs.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—A course suitable for D.C.H. candidates will be given at the Infants Hospital from Sept. 20th to 25th, and a course in proctology at the Gordon Hospital from Sept. 27th to Oct. 2nd. A two-day course in plastic surgery will take place on Sept. 15th and 16th. A week-end course in ophthalmology will be given at the Royal Westminster Ophthalmic Hospital on Sept. 25th and 26th, and a course in fevers will be given at the Park Hospital on Oct. 2nd and 3rd. Detailed syllabuses of all courses, which are only open to members, can be had from the secretary of the fellowship, 1, Wimpole-street, W.1.

MINOR POINTS IN DIPHTHERIA IMMUNISATION

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DIPHTHERIA immunisation is one of the most discussed questions of the moment; it has, therefore, seemed worth while to record some results obtained from work carried out in schools and institutions, both rural and urban, during the years 1934–36. No definite conclusions will be drawn as the numbers are too small. The actual figures are recorded as giving some indication of the methods employed.

METHOD

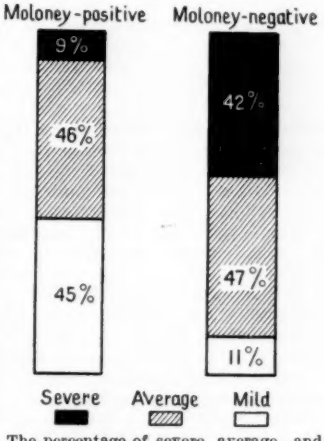
The *technique* was that usually used for intradermal testing. The subjects all had a preliminary Schick test, after which they received treatment with the appropriate reagent; finally, a second Schick test was carried out at varying intervals after treatment to determine the results. The materials employed were toxoid-antitoxin mixture (T.A.M.), toxoid-antitoxin floccules (T.A.F.), and anatoxin or formal toxoid (F.T.)

Sensitivity.—It has been long realised that F.T. in sensitive individuals is capable of causing severe reactions. To eliminate these, it is necessary to detect susceptible individuals by means of either of the following:—

(1) The Moloney (1927) test, the technique of which is similar to the Schick test. The test material is 0·2 c.cm. of a 1/20 dilution of F.T. Induration surrounding the site of injection (except that due to slight trauma of the test) is taken as the criterion of a positive reaction, indicating a sensitive individual; or

(2) The "detector dose" as described by Chesney (1934). In this method a small preliminary subcutaneous injection of 0·1 c.cm. or 0·2 c.cm. is given; susceptible individuals show a mild local or general reaction.

Once individuals sensitive to F.T. are known, unpleasant reactions may be avoided by modified dosage or the use of one of the other materials available.



The percentage of severe, average, and mild Schick reactions in Moloney-positive and Moloney-negative groups.

Assessment of results.—The results from all sources have been collected and analysed as a whole; they are recorded in Tables I and II. The term "standard dosage" indicates the system of dosage mapped out before the commencement of treatment: "special dosage" the dosage decided for each case individually on account of a positive Moloney reaction, or some other contra-indication to F.T. As individuals vary in their degree of susceptibility, instead of merely recording a Schick result as positive or negative, an attempt

was made to classify them as faint, average, and severe. This classification was made on clinical grounds—a reaction about 1·5 cm. by 2 cm. in diameter, and salmon pink in colour, being considered as "average." Most of the cases in this series had simultaneous Schick and Moloney tests performed. (In passing it may be remarked that the percentage of

TABLE I—*Standard Dosage*

Material used.	Dosage (c.cm.)	Treated.	re-Schicked.	Schick-positive.	Per cent. immunised.	Remarks.
F.T.	0·5; 1·0; & 1·0	18	18	—	100	Moloney negatives.
	1·0; 1·0; & 1·0	68	68	8	*82	Unselected.
	1·0 & 1·5	27	25	2	92	Unselected.
	1·0 & 1·0	111	106	8	92·5	Moloney method.
	0·1 & 1·0	40	38	17	50·2	"Detector dose" method.
	0·2 & 1·0	42	40	11	72·5	
T.A.F.	1·0 & 1·5	5	5	2	60	Staff of some institutions and Moloney-positives.
	1·0 & 1·0	10	6	2	66	
T.A.M.	0·5; 1·0; & 1·0	34	27	10	63	Moloney-positive mainly.

* This group, consisting of children up to 12 years—more than half being from 3–5 years—did not have a preliminary Schick test. Seven months after treatment 96 per cent. were Schick-negative.

TABLE II—*Special Dosages*

F.T.	1·0 & 0·5	9	9	1	90 %	"Special doses" in the Moloney method.
	1·0 & 0·2	6	6	—		
	1·0 & 0·1	3	3	—		
F.T. and T.A.F.	1·0 & 0·5	2	2	—		
	0·1 & 0·5	1	1	1		
	0·1 & 1·0	2	1	1	—	"Detector dose" method.

Schick-positive reactors is much higher in the Moloney-negative group; the Moloney and Schick tests seem to run counter to one another.) The Schick-positive reactors were divided into Moloney-positive and Moloney-negative groups and the proportion of "faint," "average," and "marked" Schick reactions in each group determined. The accompanying diagram serves best to illustrate the relationship. It will be seen that, while the average Schick test comprises about 50 per cent. of reactions in both groups, the bulk of the remainder is severe in the M-negative group and faint in the M-positive group.

In some way a positive Moloney appears to be some index of immunity to diphtheria.

REACTIONS

In this series reactions were not found to be a severe handicap when using anatoxin. They could be more or less completely eliminated by the detection of sensitive individuals by the Moloney test or detector dose or some other reagent, and treatment by greatly reduced doses. Although possible to avoid reactions, it is not possible to ignore them. Nothing is more likely to antagonise the public than a number of sore swollen arms and high temperatures.

The danger is well illustrated by a case where a full dose of toxoid was given to a Moloney-positive patient, a girl aged 14 being prescribed 10 c.cm. anatoxin. A reaction consisting of headache, vomiting, and general malaise developed within twenty hours; the temperature rose to 101° F. The child was ill for three days, after which the symptoms gradually subsided.

Unusual reactions are so rare in connexion with immunisation that it seemed worth while to record three that occurred:—

1. A boy, aged 16, showed an intense reaction to the Schick test and control. There was a reddened area, about 5 cm. in diameter, at the site of injection. Engorged lymphatics ran up the arms as far as the elbow, and a faint scarlatinal form rash developed on the chest. There was nothing else suggesting scarlet fever; the condition cleared up in 12 hours. The boy never felt ill.

2. A girl, aged 12, was Moloney-positive, the indurated area being 1·5 cm. in diameter. Surrounding this area was a ring of petechial hæmorrhages about 1 cm. wide. The girl was Schick-negative and showed no other abnormalities.

3. A nurse, aged 22, was Schick-positive although she had had diphtheria 14 years ago. She was treated with three doses of T.A.M. (0·5, 1·0, and 1·0 c.cm.) causing a slight local and general reaction. An eruption of herpes labialis appeared 24 hours after each injection, after which the slight malaise cleared up. The herpes pursued a normal course. No reference could be found to this type of reaction but it makes an observation of Alderhoff (1931) interesting. Writing on immunisation in Holland he notes that encephalitis developed in a few cases treated with T.A.M.

TABLE III—*Results of Serum Sensitisation*

Age.	Result of test. (*a*) Before any injection. (*b*) After F.T.	Interval after injection (days).	After injection and T.A.M.	Interval after injection (days).
2 yrs.	Nil.	21	Indur.	14
1 yr.	(*a*) Nil; (*b*) ? v. sl. indur.	13	Severe indur.	13
7/12	Nil.	17	Indur.	13
4/12	(*a*) Sl. indur; (*b*) Nil.	17	,,	13
10		13	,,	15
10		16	Sl. indur.	15
7/12		17	Indur.	15
3/52		17	,,	15
2/52	Nil.	15		
2		15		
13		30	Not tested with T.A.M.	
9		16		
5		10		

V. sl. indur. = very slight induration.

SENSITISATION TO SERUM

There is one aspect of immunisation which does not seem to have received much attention. The immunity producing mechanism is closely connected with sensitisation to the serum proteins. It must be remembered that T.A.M. contains antitoxin usually derived from horses. It is logical to assume therefore that, in addition to immunising a child, this material is also making him serum-sensitive. This would not be of any importance if all immunisation was perfect and no other serum-treated diseases existed; unfortunately neither is the case. This point has been already noted; Gordon and Creswell

(1929) record that in the serum treatment of scarlet fever, serum reactions occur in 74·1 per cent. of cases who have previously been immunised against diphtheria and in only 18 per cent. of non-immunised individuals.

Theoretically this sensitisation ought not to be produced by F.T. and a small experiment was carried out to test the point. The subjects were infants and young children suffering from congenital syphilis and ophthalmia neonatorum. At this age they were presumably not serum-sensitive, but in order to obviate any fallacy from this reason, they all received a preliminary intradermal test of 0·2 c.cm. 1:5 dilution horse-serum. The reaction was read in 1, 3, and 24 hours, swelling, induration, and redness being considered as indications of a positive result. The subjects then received 1·0 c.cm. F.T., and the same test was repeated at varying intervals (never less than 10 days, time to let serum sensitisation develop), the same criteria of a positive reaction being taken. The procedure was then repeated with T.A.M. Table III indicates the results.

It will be seen that T.A.M. produces a sensitisation to horse-serum—a point in favour of F.T.

DIPHTHERIA IN AN IMMUNISED COMMUNITY

A small epidemic of diphtheria, occurring concurrently with an epidemic of mild tonsillitis and pharyngitis, formed a practical test of the efficiency of immunisation. The inmates of a home, drawn from rural districts—normally highly susceptible to diphtheria—were immunised in April, 1935, and all (about 120) were Schick-negative in June. Infection with *B. diphtheriæ* occurred as follows:—

CASE 1.—Man, aged 20, naturally Schick-negative, developed clinical diphtheria on Oct. 4th. He was treated with 8000 units diphtheria antitoxin (D.A.T.) and recovered by Nov. 15th.

CASE 2.—Girl, aged 19, developed clinical diphtheria on Oct. 14th and was treated with 10,000 units D.A.T. She was Schick-negative in June, following treatment with F.T.

The other cases were carriers rather than clinical cases.

CASE 3.—Girl, aged 20, had mild tonsillitis and pharyngitis. Swab was positive on Oct. 18th.

CASE 4.—Girl, aged 15, complained of mild sore-throat. Swab was positive on Nov. 13th.

CASE 5.—Girl, aged 14, had mild tonsillitis. Swab was positive on Nov. 13th.

Cases 4 and 5 had clinical diphtheria in January, 1935.

At the same time as the odd cases of diphtheria were developing and carriers were being detected, a wave of very mild tonsillitis and pharyngitis, comprising about 30 cases, and apparently quite independent of the diphtheria cases and carriers, was occurring in the home. The victims were not ill enough to be reported as sick and none developed diphtheria, but this mild epidemic indicated that droplet infections were taking place.

These facts show, first, that virulent diphtheria organisms had been introduced into the home, as two clinical cases occurred in addition to three carriers. Secondly, conditions were suitable for the development of droplet infections—as shown by the occurrence of an epidemic of mild tonsillitis. Thus, virulent organisms were present in a normally susceptible community, under conditions suitable for spread. Only two cases occurred. This seems an argument in favour of artificial immunisation. A high degree of success in face of known danger is perhaps more convincing than complete success against an assumed but unproven one.

SUMMARY

1. The results of various methods of immunisation against diphtheria are given.

2. Sensitive subjects can be eliminated by the Moloney and "detector dose" tests; some unusual reactions are noted.

3. T.A.M. was found to produce serum sensitisation to a therapeutic serum.

4. The behaviour of a small epidemic of diphtheria in an immunised community is recorded.

I have to thank Dr. W. T. Benson, late medical superintendent to the Edinburgh City Hospital, and Dr. W. G. Savage, county medical officer, Somerset, for permission to publish the records and figures found in this paper, which is based on a thesis submitted to Edinburgh University for the M.D. degree.

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EPHEDRINE IN THE TREATMENT OF ENURESIS

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THE discovery that ephedrine relaxes the involuntary muscle of the bronchioles in asthma has given this drug an important place in therapeutics. It acts by a stimulation of the sympathetic nerve-endings which is much more prolonged than that of adrenaline. Most of the involuntary motor and secretory functions of the body are under the control of the sympathetic nervous system, which increases or inhibits activity according to the tissue or organ supplied. It follows, therefore, that ephedrine will have many effects and that its usefulness is not necessarily limited to its action in the bronchioles. Thus it is employed locally to contract arterioles and lessen secretion in nasal catarrh, while given in association with amylocaine and other spinal anæsthetics its general vasoconstrictor action serves to minimise any fall of blood pressure.

Many asthmatics are from time to time forcibly reminded that ephedrine has more than one action. Precordial discomfort and throbbing in the head are not uncommon, and some subjects suffer acutely from the effect of ephedrine on the bladder. This consists in an inability to urinate, notwithstanding a strong desire to do so. The symptom may last for some hours. When it is realised that the internal sphincter of the bladder is innervated by sympathetic fibres, the explanation of the retention is not far to seek. This effect on the bladder, though unwelcome in asthma, is potentially valuable in conditions where there is a difficulty in bladder control, and for the last three years I have sought to utilise ephedrine as a remedy in the nocturnal and diurnal incontinence of children.

In a disorder which shows a tendency to spontaneous cure and which is also susceptible to psychological influences, it is difficult to assess the value of any particular remedy. In some of my cases however it seems probable that the pharmacological effect of ephedrine was the deciding factor.

The method adopted is as follows. The presence of a urinary infection is first excluded by examination of the urinary deposit. Half a grain of ephedrine alkaloid in tablet form is then prescribed to be given at bedtime. The dose is increased by gr. ½ every three to four nights until in certain instances as much as 5 grains are being taken. In those cases which respond favourably it is found that enuresis at first becomes less frequent and then, as the dose is increased, disappears altogether.

RESULTS

The results achieved may best be illustrated by citing two specific cases of severe enuresis.

A boy of 10 with a strong urinous odour had never been able to control his bladder at night and suffered from frequency and occasional incontinence during the day. He was a heavy sleeper and his bed was always very wet. The nightly dose of ephedrine was gradually increased to 3½ grains. On gr. 2½ enuresis only occurred occasionally and then to a less extent than formerly, in that his mother reported the bed as much less wet. At the same time incontinence ceased during the day. On one occasion, when the tablets were forgotten, enuresis was as bad as ever. After three months' treatment enuresis ceased completely. The administration of the drug was continued for a further three months and at the end of this period it was found that he remained dry even when the ephedrine was remitted. He has remained well since.

A girl of 16 had been unable adequately to control her bladder from infancy. Enuresis occurred every night and micturition often took place involuntarily during the day. Apart from this one symptom she appeared normal in every way. Treatment with belladonna and other recognised procedures had been conscientiously carried out but there had been no response. Ephedrine was given in gradually increasing doses until she was taking gr. 2 at bedtime and two doses of a grain each during the day. On this régime the incontinence ceased and after continuing for several weeks it was found that she could dispense with the tablets, normal bladder function having been secured.

In other cases the response is less complete. The frequency of enuresis is diminished so that the child, who has been incontinent every night, may miss a variable number of nights each week, or dry periods may alternate with short relapses when the bed is again wet every night. The general tendency is however towards improvement and ultimately after some months of persevering treatment the enuresis ceases. In this type of case ephedrine appears to be an adjuvant to bladder control, though its effect is not strong enough to maintain sphincter tone in all circumstances.

In yet other cases ephedrine fails completely or even makes the condition worse. The reason for this appears to be that the objectionable effects of the drug on other parts of the nervous system overshadow the effect on the bladder and make it impossible to increase the dose to the desired level. Prominent among these side-actions is cerebral stimulation. The child may be simply restless at night or there may be pronounced insomnia. Sometimes there is sleep-walking and in one of my cases delusions were present. The patient, a boy of 5 on gr. 2 of ephedrine at night complained until noon next day of seeing fishes everywhere and that they were biting him. In some cases vomiting may occur about 2 A.M. It is not usually accompanied by nausea or prostration and the child falls asleep again almost immediately. More rarely complaint is made of palpitation. Toxic effects cease promptly when the drug is remitted but parents should be warned beforehand of the symptoms which may occur. The insomnia due to ephedrine is to some extent relieved by giving gr. ½–1 of phenobarbitone simultaneously.

The results obtained in 38 consecutive and unselected cases of enuresis treated with ephedrine were as follows:—

—	Boys.	Girls.	Totals.
Enuresis ceased	5	5	10
,, improved	8	6	14
,, uninfluenced	4	4	8
Treatment not maintained ..	3	3	6
—	20	18	38

Many different ages and different constitutional types are included in the series. The impression gained was that the older children of comparatively phlegmatic type benefited most from the treatment and it was these children who tolerated up to gr. 5 of ephedrine without showing any untoward symptoms. Such a dose given to an average person would produce considerable distress, and it is possible that the increased tolerance of these subjects to a sympathetic stimulant such as ephedrine may have a bearing on the ætiology of enuresis.

DISCUSSION

The difficulty of identifying a causal factor common to all cases of enuresis, whether that factor be a certain constitutional type, a physical defect, or a psychological maladjustment, has again been brought out in a recent discussion (Royal Society of Medicine, 1936). In the present study careful inquiry was made into the personal and family history of each patient and a complete physical examination made. Enuresis in other members of the family was only rarely reported and, though an investigation into hereditary influences could not be carried out with the same thoroughness as that of Frary (1935), the results of questioning the mothers of the patients did not confirm his view that enuresis is an inherited defect.

Sources of possible peripheral irritation such as adenoids and threadworms were for the most part absent, or had already been dealt with without the enuresis being ameliorated. It was noted however that a considerable number of the boys had not been circumcised.

The suggestion that enuresis is an allergic manifestation has been made by Bray (1931) who has also reported favourable results from the use of ephedrine. In the present series careful inquiry as to possible allergy either in the patient or the relatives nearly always failed to support this view. Tests for protein sensitivity were not however carried out.

The importance of psychological factors in enuresis is widely recognised and is indeed apt to be exaggerated. Unsatisfactory environmental features may often be found, but it does not follow that these must necessarily be in causal relationship to the enuresis. As a rule the environment and the child's attitude to it seemed to be beyond reasonable criticism. In the few cases where there were definitely unhappy home conditions on which the incontinence was dependant, it was noted that ephedrine did not produce any improvement.

In enuresis the influence of suggestion needs careful consideration in attempting to explain the action of any new measure. That it is of limited importance as far as ephedrine is concerned seems to be indicated by the fact that often patients who have been improved by this drug have previously experienced disappointment with other remedies. Moreover,

in many of the cases, where the incontinence has not been improved by a small dose, improvement only begins after the dose of the drug has been several times advanced. There is little doubt that the main action of ephedrine is on the endings of the sympathetic nerve-fibres supplying the bladder, stimulation of which increases the tone of the sphincter and depresses that of the fundus. Hobhouse (1932) has emphasised the apparent increase in parasympathetic tone during normal sleep and he believes that an exaggeration of this is sometimes responsible for nocturnal enuresis. He lays stress on the fact that many sufferers from enuresis sleep exceptionally soundly—an observation I have confirmed. In this connexion the additional action of ephedrine as a cerebral stimulant is probably of importance. A child who usually sleeps soundly tends after a dose of ephedrine to sleep much more lightly, as evidenced by unwonted restlessness or wakefulness. It is possible that the superiority of ephedrine over belladonna may be explained in this way. Belladonna has been employed for many years in urinary incontinence, sometimes with success, but more often with disappointing results. There seems to be no reason why depressing the parasympathetic nerve-endings, which supply the depressor mechanism, should be in any way inferior to stimulating the inhibitory mechanism as with ephedrine. In practice however ephedrine is more effective than belladonna and it seems not unreasonable to suppose that the difference may be dependant on the greater ease with which ephedrine produces cerebral stimulation.

The fact that many sufferers from enuresis are able to tolerate doses of ephedrine considerably in excess of those usually regarded as maximum lends support to the view that enuresis is sometimes a manifestation of a constitutional type, where the parasympathetic-sympathetic balance is weighted in favour of the parasympathetic system. In this way it may be assumed that considerable enhancement of sympathetic activity is required before the hypertonic parasympathetic can be adequately opposed. Thus a relatively large amount of ephedrine is utilised and there is no excess to give rise to unwelcome side-effects.

SUMMARY AND CONCLUSIONS

Ephedrine was given in 38 consecutive cases of enuresis over periods up to several months. The enuresis ceased in 10 cases, and there was improvement in 14 others. The ephedrine sometimes caused restlessness and other side-effects, but these were seldom seen in older children of phlegmatic type, some of whom seemed to have an unusual tolerance to the drug.

Those cases in which enuresis persists throughout school life only to cease in the late teens or early twenties are precisely the ones in which ephedrine appears to be of most value. The peculiarity may be a grave handicap to the otherwise normal boy or girl and the assurance that the symptom will be outgrown in due course does little to relieve present embarrassment. To such sufferers in particular ephedrine offers a prospect of permanent cure, and it is worthy of trial in the majority of younger subjects, many of whom will be similarly benefited.

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CUSHING'S SYNDROME IN A MULATTO

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With a Histological Report by
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A MULATTO woman, aged 35, was admitted into the City General Hospital, Leicester, on April 27th, 1936, suffering from a left-sided lobar pneumonia of three days' duration.

HISTORY

The patient was the only child of an illicit union, her father being black and her mother white. She was herself unmarried and had given birth to a male child at the age of 30. Amenorrhœa had persisted since the commencement six years ago of that, her only pregnancy. A few months after the birth of the child she began to show signs of increasing obesity, and by the end of four years was almost 2 st. heavier, but thereafter her weight remained more or less stationary. The distribution of adiposity was not noted. A little over six months before her weight ceased increasing, hair was noticed on the chin and upper lip, but it never became very abundant; it heralded the onset, however, of occasional frontal headaches and mild attacks of nocturnal dyspnœa. Little reliable information could be obtained about the question of striæ. The patient admitted that there were a lot on her abdomen but had paid little attention to them. There was no alteration of voice or loss of libido. Her previous health was excellent. The menarche occurred at the age of 13; catamenia regular every 28 days and lasting 4–5 days.

EXAMINATION

When examined after the subsidence of the pneumonia her intelligence was fair, cerebration sluggish, disposition cheerful; no hoarseness of voice. Stature short with a slight dorsal kyphosis. Generalised adiposity present, affecting especially the face, shoulders, and girdle region. A large goitrous swelling was visible in the neck—of the appearance of which, incidentally, the patient had taken no note, regarding it as part of the increasing obesity. Skin dark brown in colour. Numerous violaceous striæ distensæ present on the abdomen; no other evidence of abnormal pigmentation either of the skin or of the immediately visible squamous mucosa. No petechiæ or ecchymoses. Moderate hirsuties of the chin and upper lip. The pubic hair showed no definite tendency towards a male distribution. Teeth satisfactory.

Cardiovascular system: radial arteries palpable; a regular tachycardia, 110 per minute, was present; pulse of increased force and raised tension; blood pressure. 232/158 mm. Hg; apex-beat not localisable; no cardiac murmurs; second sound accentuated, more especially in the aortic and pulmonary areas; no œdema; no acrocyanosis. Lungs normal. Breasts pendulous, no obvious atrophy. Abdomen prominent (striæ as above); no tumour palpable. Thyroid diffusely enlarged; no palpable thrill; a cyst about the size of a walnut in the right lobe. Central nervous system: muscular power, sensation, deep and superficial reflexes normal; no exophthalmos; visual acuity fair, no impairment of the visual fields; no change of psyche in the direction of masculinity. Genito-urinary system: clitoris not enlarged; digital vaginal examination revealed nothing abnormal.

SPECIAL INVESTIGATIONS

Urine was acid; specific gravity 1024; albumin, sugar, and acetone present in small amounts; a few

hyaline and many granular casts and a few red blood-cells on microscopic examination. *Blood:* red cells 4,580,000; hæmoglobin 87 per cent.; colour-index 0·96. White cells 7500, including granulocytes 6150 and lymphocytes 1050. Wassermann reaction negative. *Cerebro-spinal fluid:* under slight pressure; clear and colourless; no cellular or biochemical abnormality. *Ophthalmoscopic examination* revealed a fairly severe bilateral neuro-retinopathy, with choked discs, severe sclerosis of the retinal vessels, numerous patches of fatty change, and several small hæmorrhages. *Glucose-tolerance test:* fasting blood-sugar, 110 mg. per 100 c.cm.; one hour after 50 g. of glucose, 225 mg.; two hours after, 200 mg. *Renal function test:* the urea-concentration range (Calvert-Cameron) showed a maximum concentration in the urine of 1·9 per cent. after 15 g. of urea, and a minimum dilution to 1·3 per cent. after 2 pints of fluid. *X ray examination:* pituitary fossa enlarged; slight generalised osteoporosis; fracture of eleventh rib on left side anteriorly (there was no history of trauma); considerable left ventricular cardiac enlargement. *Electrocardiogram:* left axis deviation, otherwise normal.

PROGRESS

After the symptoms of pneumonia had disappeared slight pain still tended to persist in the left side of the chest (at the site of the fracture shown later by radiography). A mustard leaf was applied therapeutically. Removal of this revealed a deeply pigmented patch, dark brown in colour with a violaceous tinge, corresponding exactly to the size and shape of the leaf. About a fortnight after admission the patient began to get up for short periods. Weight 11 st. 3 lb.

On June 7th she had an attack of acute pulmonary œdema. Blood pressure 265/175 mm. Hg. From now onwards she was bedridden, similar attacks occurring on several occasions, and she also had occasional fits of depression. On July 12th cardiac arrhythmia present in the form of numerous irregularly recurring extrasystoles; blood pressure 266/210 mm. Hg; neuro-retinopathy more severe; blood-urea 111 mg. per 100 c.cm. The specific gravity of the urine had been steadily diminishing during the few weeks previous to this. No increase of adiposity had been noted. On August 2nd œdema of the ankles was present. A definite change of psyche was noted about this time. The patient became rather drowsy, her attention could not be fixed, and speech was essentially in the form of a rambling soliloquy not infrequently devoted to the expression of heterosexual desires. The specific gravity of the urine had by now become fairly well fixed in the neighbourhood of 1012. Henceforward the œdema gradually became generalised. On August 7th the blood-urea was 388 mg. per 100 c.cm. On the 10th a definite pallor developed, coincident with the appearance of widespread ecchymoses, which were especially numerous on the trunk. She became stuporous, with a falling blood pressure, and died in the evening.

POST-MORTEM EXAMINATION

Heart: gross hypertrophy of the left ventricle; the coronary arteries showed only a mild degree of arteriosclerosis. Aorta: numerous atheromatous patches throughout its length. Lungs rather pale and œdematous. Kidneys: no diminution in size; the outer surfaces were slightly granular; slight relative reduction in the breadth of the cortices; some increase of peripelvic fat.

The hypophysis was enlarged; it was separated with difficulty from the posterior surface of an enlarged pituitary fossa. A large adenoma was present in the anterior lobe. Weight of the gland 2·1 g. (0·0029 per cent. of body weight). Adrenals enlarged owing to a great increase in size of the cortices; no visible adenomata. Weight of the left gland 34 g., and of the right gland 26 g. (0·085 per cent. of body-weight). Thyroid: diffusely enlarged. Outer surface smooth. Cut surface reddish-brown in colour. A large cyst, 2 in. in diameter and containing a colloid-looking material, was present in the right lobe. Parathyroids: not enlarged; removal for section neglected. Thymus: not apparent. Pancreas: of normal size; rather firm in consistency. Ovaries small; single large cyst, 2¼ in. in diameter, in the right. Uterus normal.

HISTOLOGICAL REPORT

Hypophysis.—The gland is enlarged. It measures 2 cm. from anterior to posterior margin. The anterior lobe is greatly compressed by a rather ovoid-shaped adenoma, which is extremely friable. On microscopical examination the adenoma is seen to consist of basophil cells. There is practically no stroma in the tumour except that carrying the relatively few blood-vessels. The basophil cells are rather smaller than those seen in the normal gland. They tend to be arranged in radial fashion around the blood-vessels, and the radial cells are columnar in shape, and rather larger than the other tumour cells. Various forms of transitional basophils and a few chromophobes are also found. The anterior lobe is found as a crescentic mass between the tumour and the posterior lobe. The basophil cells in this remaining anterior lobe tissue show the hyaline change described by Crooke (1935). There is a little basophil invasion of the pars nervosa.

Thyroid.—This shows no lesions. The acini are rather large, filled with colloid, and lined by a flat epithelium.

Adrenals.—The cortex appears hyperplastic. This seems to be due to a diffuse change rather than to any localised adenomatous formations. The cells of the cortex, with the exception of those of the zona glomerulosa, give the fuchsinophil reaction described by Vines (Broster and Vines 1933). The medulla has no lesions. The cortical arterioles show thickening and hyalinisation.

Pancreas.—No appreciable changes in the islet tissue; there is no hyalinisation. The acinar tissue and ducts are normal. The arterioles are thickened and show fatty and hyaline degeneration.

Ovary.—There are numerous follicles some of which are in various stages of follicular maturation. There is no excessive follicular maturation or luteinisation.

Kidney.—The glomeruli and tubules appear relatively normal. Many of the small arterioles are thickened and hyaline, but the glomeruli show remarkably little change. The large vessels are normal.

DISCUSSION

This appears to be the first verified case of Cushing's syndrome occurring in a coloured subject. An interesting feature of the anamnesis is the persistence of amenorrhœa after childbirth, suggesting the possibility at least of pregnancy having been a predisposing or an actual exciting factor. The clinical findings are characteristic. Virilism was not very pronounced. The radiographic evidence of osteoporosis was inconclusive, although the presumably pathological fracture of a rib favoured its presence. Lachmann and Whelan (1936) consider that any decalcification of less than 20 per cent. can only be diagnosed under the most favourable circumstances, and that the calcium loss in most bones must be higher, even up to 40 per cent., in order to be visible. Enlargement of the sella turcica is a very unusual finding in Cushing's syndrome. Its definite radiographic presence here was practically pathognomonic of a basophil adenoma, and taken in conjunction with the mild degree of virilism, made a diagnosis of adrenogenital syndrome unlikely. A diabetic type of glucose-tolerance curve was obtained. No polycythæmia was found. The mental aspect of endocrine disturbance has come into some prominence lately, but the terminal psychic changes that occurred can well be attributed to circulatory changes in the brain secondary to the hypertension and cardiac failure, without implicating the diencephalo-pituitary apparatus.

The autopsy revealed that the kidneys were remarkably little damaged, confounding a clinical diagnosis of nephrosclerosis based on the gross hypertension, severe neuro-retinopathy, poor result of the renal efficiency test, high blood-urea, and the terminal fixing of the specific gravity of the urine

near 1010, the approximate level of the maximal concentrating power of decompensated kidneys. The apparent signs of renal failure must have been largely of pre-renal origin, associated with the hypertensive cardiac failure, which eventually caused death.

The constant phenomenon of hyaline change in the basophil cells of the pituitary, which Crooke (1935) regarded as indicating altered functional activity rather than degeneration, was observed. The basophil adenoma was very large compared with those usually found, being almost 2 cm. in diameter. A colloid type of goitre was present. Little pathological change was visible in the islet tissue of the pancreas. As usual, adrenal cortical hyperplasia was found and, what is probably more significant, the fuchsinophil reaction of Vines was demonstrable in certain cortical cells. The ovaries showed no atrophic changes.

ADDENDUM

"Inhibition of the gonads is present in Cushing's syndrome." Is this an accurate statement of fact? Would it not be more correct to say, in a woman, that there is an inhibition of the feminine gonads and a stimulation of masculine rudiments in the adrenal cortex? In other words, might the virilism be an indication of some "androtropic" change in the normal "gynæcotropic" activity of the gonadotropic secretion of the anterior hypophysis? If one believes that the gonadotropic hormone is formed in the basophil cells, this conception helps to reconcile the apparent paradox of a basophil adenoma being associated with "inhibition of the gonads." Further, might this suggested androtropic change be manifested by hyalinisation of the basophil cells and, secondarily, by a fuchsinophil reaction of Vines in certain of the adrenal cortical cells, and even, secondarily also, by a basophil adenoma itself, on a compensatory gynæcotropic basis? The gonads are well known to exert a diabetogenic action, either because of their specific function or through their influence on other organs. On the above hypothesis, the diabetes mellitus found in Cushing's syndrome might be largely due to a combination of normal and abnormal gonadal activity causing a relative insufficiency of insulin. It could also be argued that such a summation might in some way be the mediatory cause of the hypertension. Finally, one can wonder whether there may not be normal cycles of androtropic activity in the female (possibly during the luteinisation phase of the menstrual cycle), and of gynæcotropic activity in the male, which have a profound influence on the determination of sex. In this connexion, it is interesting to note that the child of the patient, in the case reported above, was a male, permitting one to speculate whether this male gestation, conceived possibly during a phase of normal androtropic activity, could have initiated an abnormal androtropic activity ultimately manifested as Cushing's syndrome.

We are indebted to Dr. E. C. Hadley, medical superintendent of the City General Hospital, Leicester, for permission to publish this case, and to Dr. E. M. Ward, pathologist to the Leicester City Hospitals, who performed the autopsy.

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CLINICAL AND LABORATORY NOTES

CONTROL OF LOCAL SEPSIS IN RADIUM THERAPY BY THE USE OF PROFLAVINE OLEATE

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THE radiotherapeutic treatment of a malignant lesion in the presence of sepsis as a complication of the neoplastic process, is not only difficult technically but involves the risk of the spread of a localised infection. Moreover the malignant tissue is less likely to respond so well to irradiation. Attempts have therefore been made to improve the treatment of septic complications before radium is applied. The results obtained by the method described below seem to merit record.

I have found a definite place for a suitable type of antiseptic in certain branches of radium work: before and during treatment as well as during certain phases of the period of reaction. Such an antiseptic must have a good bactericidal action, but must be non-irritating, and should preferably be capable of application in some bland oily medium. The common antiseptics proved very disappointing; but acriflavine in a strength of 1–1000 in a simple mixture of equal parts of olive oil and lime water was less unsatisfactory. It seemed likely, however, that a better preparation might be obtained, and with the assistance of Prof. C. H. Browning I was able to try a preparation of proflavine oleate. This was made up in a strength of 1 per cent. in liquid paraffin and also in olive oil. The preparation proved to be a stable and entirely suitable material from all points of view, and it has been in constant use since July, 1936. There did not appear to be any significant difference between its action in liquid paraffin and that in olive oil, so the former medium was chosen.

The chemical and antiseptic properties of the proflavine oleate were investigated by Browning nearly 20 years ago, and it was used originally in the treatment of open septic wounds by C. Berkeley and V. Bonney.[1] It is comparatively insoluble in water, but when the medium containing it is intimately admixed with serum, sufficient dissolves to impart pronounced antiseptic properties to the serum. When proflavine oleate is brought into close contact with the tissues a "depôt" of antiseptic is secured. It also possesses a physical property which is of great clinical value: when dressings and packing covered with it are applied to a raw surface they do not adhere and so can be readily and painlessly removed later on. A recent comprehensive review by Browning[2] of the chemotherapeutic antiseptics contains much useful information regarding their pharmacology and practical applications.

It is in the radiological treatment of cases of carcinoma of the cervix and of malignant lesions involving the skin that I have found this antiseptic most useful. Since

[1] *Brit. med. J.* 1919, **1**, 152.
[2] *Edinb. med. J.* 1937, n.s. **44**, 497.

1929 treatment of carcinoma of the cervix has been carried out in the Western Infirmary by radiological methods alone. The radium technique is based upon the methods used at Stockholm, and, since February, 1936, by the coöperation of Dr. J. S. Fulton, preliminary treatment with X rays has formed part of the routine. Improvement in the control of local sepsis was manifest clinically from the time when proflavine oleate was first used at the end of July, 1936, and in my view is attributable entirely to the action of the antiseptic. While pelvic sepsis after utero-vaginal application of radium has been a rare complication, even in advanced cases, the local sepsis associated with an ulcerating neoplasm is always much aggravated after radiotherapy, even after the comparatively short local treatments associated with the Stockholm principles; the packing becomes foul and the patient is often miserable. The use of packing saturated in the proflavine preparation to keep the radium in position has changed the situation completely, and only in very few cases is it desirable to resort to preliminary application of the antiseptic as well. The patient is more comfortable throughout, little discharge occurs after treatment, and the packing comes out in a reasonably fresh condition. No system of douching can, in my experience, achieve such results. It is obvious, however, that local applications will not affect a pyometra, for which free drainage must remain the only treatment possible.

When *malignant lesions involving the skin*, either primarily or secondarily, with attendant ulceration and sepsis, require to be treated by implantation of radium, preliminary dressing with proflavine oleate will dry up the septic discharge rapidly and render the part clean enough for the operation. No dressings may be necessary during the period of radiation, or possibly one change will suffice, and no active sepsis will be evident if the preparation is liberally applied and not allowed to dry. The effect is much superior to that obtained with any other antiseptic I have tried, including watery solutions of acriflavine. These considerations apply with equal force to surface applications of radium and make it possible to treat the patient with a minimum of discomfort or disturbance of apparatus. It may be convenient to give certain surface treatments by the method of building up an apparatus with Elastoplast and adhesive felt, and, should the lesion be an ulcerating one, it is often safe to cover it entirely after preliminary application of proflavine oleate.

My experience has led me to use the preparation regularly as an antiseptic in cases for implantation where there is no sepsis, but where it would be difficult to prepare the skin by other means, as, for example, in the region of the inner canthus of the eye. After treatment of the neck with radium collars at a distance of 5 cm., small chronic septic foci occasionally develop in the skin, and these may be prevented by frequent painting with proflavine during the period of exposure. Finally, it has been found in the throat, nose, and ear wards that the preparation controls sepsis where "exenteration" of nasal sinuses has been carried out for malignant disease and radium apparatus has been inserted.

The preparation also proves useful during the reaction period if the growth has ulcerated, or if there is much discharge and a tendency to superficial sepsis in cases where an area of skin has been subjected to moist desquamation. In either case it will usually lessen discharge and clean the part in a day or so, giving the patient great comfort both from its antiseptic action and the soothing effect of the oily medium. Simple dressings with vaseline or lanolin should then be substituted to avoid the occurrence of dermatitis. That this complication is rare may be judged from the fact that I have only seen it twice although hundreds of patients have been treated freely with proflavine oleate; in these two cases the dressings were continued much longer than was actually necessary, and the condition rapidly subsided under treatment with bland ointment.

I express with much pleasure my indebtedness to Prof. Browning for his suggestion, and also to Prof. S. J. Cameron and the visiting physicians and surgeons of the Western Infirmary who have given me every facility for elaborating radiological and concomitant methods of treatment in their wards.

RUPTURED SPLEEN FROM A SLIGHT INJURY

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Traumatic rupture of the normal spleen occurs sufficiently often that a single case is seldom reported. The case described below is of interest in that the initial injury was so slight and, having occurred some days before the patient came to hospital, had been forgotten until he was closely questioned. What had appeared, therefore, to be a straightforward case of acute appendicitis was only correctly diagnosed at operation.

The patient, a farm labourer aged 60, was admitted to Addenbrooke's Hospital, Cambridge, during the afternoon of July 20th suffering from abdominal pain.

History.—He felt in his usual perfect health when he went to bed on July 18th, but was awakened about 1 A.M. by the sudden onset of severe generalised lower abdominal pain. It was the worst pain he had ever experienced. He sweated profusely and retched but did not vomit, though he tried to do so. After an hour of pain he became much easier and fell asleep, and slept normally till the morning when he woke at his usual time. On getting out of bed the lower abdominal pain started again, though it was not so severe as before. It was a constant ache, worse on the right side of the abdomen. At no time did he have any pain or discomfort above the level of the umbilicus, nor any pain referred to the tip of the left shoulder. He felt faint on standing upright, and returned to bed where he remained until he was transferred to hospital on July 20th. He still felt sick and had no appetite. His bowels had acted normally each day. His only previous illness was enteric fever during service in the Boer War.

Examination.—Spare build, good colour and not in much pain. Temperature 99·2° F., pulse-rate 78, respirations 20. Tongue moist with a definite fur. Abdomen was slightly full but presented no other abnormality on inspection. There was tenderness all over the lower abdomen, more on the right side than the left. Rectal examination revealed no abnormality. A confident diagnosis of acute appendicitis was made.

Operation.—Abdominal palpation under anæsthetic was normal and no mass was felt. A right lower para-rectal incision was made. As soon as the peritoneum was opened fluid blood poured out, and the pelvis was full of blood. No abnormality could be found in those organs which could be examined through this small wound. This was closed and the abdomen reopened by a left paramedian incision. Here, no blood was found until a hand was passed up to palpate the spleen. The spleen was twice its normal size owing to a subcapsular hæmatoma on its convex surface. It was lightly adherent to the surrounding structures, including the great omentum. When this had been detached a few ounces of clotted blood were seen lying under the diaphragm. The capsule of the spleen had ruptured at the lower pole. The spleen was removed in the usual manner. The blood was mopped out of the peritoneal cavity as well as possible and one pint of saline poured in just before the peritoneum was closed. At the end of the operation the patient was in good condition with a pulse-rate of 100.

Progress.—He made an uninterrupted convalescence except for unexplained pyrexia on the 5th–8th days, rising in the evening to 102° F. He left the hospital on the 16th day after operation.

The day after operation the patient was questioned closely about any preceding abdominal injury. It was

only then that he remembered the slight accident which was undoubtedly the cause of his illness. On July 14th four days before the onset of his pain, while leaning over a hurdle and standing on the bottom rail, his foot slipped and he fell striking his abdomen at the level of the umbilicus. The blow was so slight that he did not even pause in his work, nor did he feel faint. He worked on the farm for the rest of that day and each succeeding day up to the onset of his pain. During this time he did his full manual work and felt perfectly well.

Pathological examinations of the spleen and blood gave normal results.

On reconsidering the case with its completed history and operative findings in an endeavour to explain the error in diagnosis, it seemed that the man sustained a hæmatoma of the spleen on July 14th and had had no symptoms until it ruptured in his sleep four days later. From the distribution of the blood in the peritoneum as found at operation it would appear that this had run across above the level of the transverse colon to the right side of the abdomen, and then down the right paracolic gutter to the pelvis.

It is well known that a perforated duodenal ulcer may simulate acute appendicitis, owing to the course taken by the escaping fluid. In this case I assume that the slow leaking of blood from the spleen, following the same mechanism, gave the symptoms and signs that led to the error in diagnosis.

I am indebted to Mr. W. H. Bowen for his permission to publish this case, on which I operated.

BRITISH MEDICAL ASSOCIATION

SECTION OF TUBERCULOSIS

AT a meeting on July 21st, Dr. JOHN R. GILLESPIE (Belfast) presiding, a discussion on

Tuberculosis in Hospital Workers

was opened by Dr. PETER W. EDWARDS (Market Drayton), who said that in England we were still without facts but that the Registrar-General had promised at the end of the year to supply data about the incidence of tuberculosis among nurses. For the moment we had to rely mainly on reports from other countries, notably from Scandinavia and from America. The following points emerged from a review of the literature of the subject. Observers were almost unanimous in finding that the nurse who reacts negatively to tuberculin at the beginning of her training runs a much greater risk of contracting the disease than does the positive reactor. As might be expected, institutions admitting tuberculous cases show a higher incidence amongst their staff than those in which no cases of the disease are treated. Obviously there could be no infection without the bacillus, but at the same time there were grounds for believing that sanatorium nurses, who are facing a known danger, run less risk of becoming infected than nurses in general hospitals admitting a few tuberculous cases often not diagnosed at the time of entry. The percentage of Mantoux-negative nurses was rapidly increasing pari passu with the decline in the prevalence of the disease, and it was significant that Mücke (1926), discussing 150 cases of tuberculosis in 4284 nurses during a period of 18 years, noted that an incidence of 1 per cent. up to 1918 was subsequently raised to 4·6 per cent. Coming to methods advocated for the prevention of infection in nurses, Dr. Edwards mentioned the work of Geer (1934), who found that the introduction of strict aseptic technique coincided with a fall in the incidence of tuberculosis from 2·75 per cent. to 1·6 per cent.

In his own experience at the Cheshire Joint Sanatorium out of 54 Mantoux-positive nurses there was 1 case of tuberculosis, whereas out of 11 Mantoux-negative there were 2; his work, admittedly on a very small scale, was therefore in agreement with that of Heimbeck and others. Dr. Edwards proceeded to discuss the best way of preventing the spread of tuberculosis to hospital workers. In the first place, he said, spitting still received too little attention. Proper disposal of sputum and the control of droplet infection by holding a handkerchief in front of the mouth when coughing were hygienic measures of the greatest importance. Nurses should be instructed not only to wash their hands when leaving the ward but also to get out of their uniforms as quickly as possible. Neither nurses' uniforms nor doctors' white coats should be worn in the residences or during meals.

At the beginning of training nurses should be Mantoux tested and those giving a positive reaction should be X rayed. Negative reactors should be tested again at 3-monthly intervals. Good results had been reported from the use of B C G, but Dr. Edwards did not think that the time had yet come for its use in this country in changing a negative to a positive reactor. The fear that increased attention to the risks of contracting tuberculosis might still further increase the difficulty of obtaining an adequate supply of nurses should be counteracted first by seeing that adequate hygienic measures were taken to prevent infection, and secondly by giving nurses the same freedom as girls employed in industry. At the Cheshire Joint Sanatorium the trained nurses were now running their hostel as a club without interference by the medical superintendent or the matron, and the experiment had proved an unqualified success.

Dr. Edwards ended with a plea for the employment in sanatoriums of doctors and nurses who had recovered from tuberculosis. At present, although no benefits could be drawn for ten years, superannuation schemes made it more serious for a doctor or nurse to contract tuberculosis than syphilis, whereas mostly the outlook was good as regards continued working capacity.

Dr. JAMES WATT (Godalming) also referred to the difficulty of getting at the facts. He thought the evidence showed a higher incidence and mortality amongst nurses not only for tuberculosis but also for other diseases. Nurses in general hospitals run a greater risk than those in sanatoriums, the incidence of tuberculosis in the latter class being probably not much different from that of the general population. However well conducted a sanatorium might be the risk of infection could not be entirely eliminated. Dr. Watt had recently been able to demonstrate the presence of sufficient tubercle bacilli to infect a guinea-pig in an appreciable proportion of the sheets and pillow-cases used by sanatorium patients. This observation indicated that patients' laundry should be put directly into bags without unnecessary handling. At King George V Sanatorium there had been no recorded case of infection of the staff with tuberculosis for 14 years, but during the last 15 months there had been three cases of erythema nodosum, two of which showed radiological infiltration in the hilar region.

Dr. ESTHER CARLING (Peppard Common) held that the two factors leading to the spread of tuberculosis in hospital staffs were infection and strain. She thought it wrong that young nurses should be subjected to the additional strain of passing examinations while doing full duty in the wards. Night duty produced an even greater strain.

Dr. MADGE MACKLIN (Ontario) stated that in Canada, although the provinces had not adopted a uniform practice, it was usual for nurses to be tuberculin tested and for the positive reactors to be X rayed; 6 out of 22 general hospitals refused T.B. negative nurses, 8 others preferred T.B. positive, but as 70 per cent. of applicants were negative they had been unable to restrict the entry to positives. Almost all nurses were T.B. positive on graduation, and most sanatorium nurses had already graduated from a general hospital. Considerable risks were run in mental hospitals where the prevalence of tuberculosis was high and where young nurses were taken on. The incidence of tuberculosis in hospital nurses was found to be about three times that of the general population; sanatorium nurses were older and had longer periods of rest than hospital nurses, they consequently had a lower incidence of tuberculosis.

Dr. ROBERT MARSHALL (Belfast) had studied the incidence and mortality from tuberculosis in the nursing staff of Belfast hospitals. In the general hospitals out of 1839 probationer nurses there had been 9 cases of tuberculosis, 5 of which proved fatal; in the mental hospitals out of 853 nurses there were 5 cases (4 fatal); 426 sanatorium nurses provided 9 cases, only 1 of which was fatal. The sanatorium nurses thus showed a higher infectivity but a lower mortality.

At a meeting on July 22nd, when Dr. A. TRIMBLE (Belfast) presided, the

Surgical Treatment of Apical Tuberculosis

was under discussion.

Dr. CARL SEMB (Oslo) spoke on thoracoplasty with extrafascial apicolysis. The primary object of collapse therapy, he said, should be the closure of cavities; this should be (1) *complete*, as the uncollapsed cavity was always a potential danger; (2) *selective*, as the already diminished vital capacity of the tuberculous patient should not be unnecessarily sacrificed; and finally (3) the *operative risk* should be small—i.e., not above 1 to 3 per cent. mortality. In the speaker's experience of 177 cases chosen for thoracoplasty 90 per cent. had upper lobe cavitation only; only 10 per cent. of this series therefore needed a total thoracoplasty. In 102 unselected cases 84 per cent. of the cavities were situated posteriorly; collapse of the upper and posterior part of the lung was thus the most frequent object of thoracoplasty. Artificial pneumothorax should always be tried first; where practicable it was the ideal method of "collapse therapy" as the introduction of air into the pleural space enabled the lung to retract by means of its natural elasticity. The aim of thoracoplasty should also be to liberate the lung and allow it to retract concentrically towards the hilum. Referring to other methods of thoracoplasty, Dr. Semb stated that even after extensive rib resections the collapse of upper lobe cavities is often incomplete, non-selective, and even contra-selective, the reason being that the lung remains attached upwards, medially, and posteriorly by adhesions which prevent it from retracting downwards. The combination of thoracoplasty with apicolysis had been designed with the purpose of overcoming these objections; the performance of extrapleural apicolysis might be difficult or impossible on account of adhesions between the parietal pleura and its surroundings; there might also be a risk of penetrating the cavity or the subclavian vein. These considerations had led the speaker to seek a more favourable route in the plane outside the endothoracic fascia. He had now carried out this type of radical apicolysis in a series of more than 250 cases without a single failure. He said that after extrapleural apicolysis the space above the lung becomes filled with exudate but when this is absorbed the lung may be drawn out again and the cavity re-expand; the extrafascial route avoids this possibility, as here the retracting lung is covered by endothoracic fascia and partly by periosteum; rib regeneration therefore fixes the lung in its retracted position. Dr. Semb proceeded to describe, with diagrams, the technique of his operation, which is performed under local anæsthesia. In planning the amount of rib to be resected the following facts were, he said, important: cavities should be accurately localised as those situated laterally require less resection than those near the mediastinum; young, relatively soft lesions are more easily collapsed than old fibrous-walled cavities; the operation is carried out in two or more stages, in the first of which three to five ribs are resected through a posterior incision and apicolysis is performed. The speaker had found, in a series of 246 cases, that a higher death-rate and more severe post-operative complications follow when six or more ribs are resected in one stage; in particular atelectasis on the affected side occurs in less than 5 per cent. of cases when only 3 or 4 ribs are resected, but rises rapidly to the high figure of 61 per cent. when a total thoracoplasty is performed in one stage. Evulsion of the phrenic nerve should not usually, according to Dr. Semb, be performed before a thoracoplasty; paralysis of the diaphragm had, he said, a very limited effect in collapsing upper lobe cavities, and by sacrificing much of the function of the healthy lower lobe it is contra-selective. In addition to these drawbacks it definitely increased the operative risks as it interfered with the effectiveness of cough so that a "drowned lung" may result. Dr. Semb had found paraffin plombage to have no advantages over thoracoplasty, the immediate mortality being higher and the risk of complications attributable to the presence of a foreign body considerable.

Mr. J. E. H. ROBERTS (London) contrasted the collapse obtained by artificial pneumothorax, which was usually unselective and sometimes contra-selective, with the more accurately planned surgical collapse. A particularly difficult group of cases were those in which on account of an apical adhesion the pneumothorax merely served to flatten a cavity against the mediastinum. Mr. Roberts agreed with Dr. Semb that phrenic evulsion rarely closed apical cavities, and in his experience also apicolysis was an unsatisfactory operation. In patients too ill to undergo apical thoracoplasty he had recently obtained encouraging results by extrapleural pneumothorax.

Dr. ANDREW MORLAND (London) said that for the chest physician the problems of thoracic surgery were reduced mainly to deciding which cases required surgical treatment and when was the most favourable time for intervention. In the absence of contra-indications a cavity which was causing symptoms was safer closed. Artificial pneumothorax should always be tried first; if it failed surgical treatment

should be considered. It was important to wait until the patient's resistance had been built up sufficiently to allow the formation of fibrous tissue to begin, surgical shock being likely to cause exudative lesions to flare up. In considering contra-indications it was mainly on the better lung that anxiety was centred; in general the quality of the lesion in this lung was more important than its extent. Small woolly shadows may require months of watching whereas more extensive fibrotic lesions may be passed. Finally the patient's psychological condition must be assessed; where nervousness is great operative shock tends to be worse, and it is worth while waiting until the patient's confidence has been gained.

Mr. G. A. MASON (Newcastle-on-Tyne) said he would like to see several new operations properly tried out, such as the ligation of the pulmonary vein from the affected lobe, the direct drainage of solitary cavities, and also lobectomy and pneumonectomy. When apical cavities are held out by adhesions which cannot be divided the diaphragm should be temporarily paralysed by a phrenic crush, the reason for this being that this operation is only effective in about 50 per cent. of cases and that should thoracoplasty subsequently be required a diaphragmatic paralysis on the affected side adds considerably to the risks of the operation. The speaker considered Dr. Semb to be unduly afraid of apicolysis with paraffin plombage.

Dr. G. S. TODD (Midhurst) considered that thick-walled cavities causing cough and sputum required active treatment without delay; this type rarely responds to A.P. and other methods should be employed if necessary. Phrenic evulsion certainly caused closure of apical cavities in some cases, and the danger of basal spread with subsequent thoracoplasty had probably been exaggerated. Apicolysis had proved disappointing and thoracoplasty gave the best chance of cure in chronic apical cavities. The Semb operation gave more complete apical collapse than previous methods, but in three cases he had seen the cavity merely pushed down and not collapsed; he had also found the after-treatment of operated cases more stormy.

Mr. H. MORRISTON DAVIES (Ruthin) said that in the production of effective surgical collapse compression was necessary and not relaxation as described by Dr. Semb. The removal of much rib was therefore a mistake as torsion of the costal cartilages played an important part in the production of adequate compression of the hemithorax.

Mr. G. B. PURCE (Belfast) mentioned the good results that might be obtained by adhesion cutting and phrenic evulsion.

Dr. L. S. T. BURRELL (London) disagreed strongly with the saying that "the treatment of tuberculosis is the treatment of cavities." Some cavitation is almost always present in the lung by the time physical signs appear, and radiography has taught us not only that cavities are more frequent than we used to think but that advanced disease with large cavities may heal. His advice would be to err on the side of doing a pneumothorax when doubtful about it, but not to be precipitate when doubtful as to the necessity of a thoracoplasty or apicolysis.

Dr. BEHRENS (Davos) also spoke of the good results he had seen from extrapleural pneumothorax which sometimes required the introduction of oil to prevent re-expansion.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

Prof. C. G. LOWRY (Belfast) presided at a meeting of this section when Prof. JOSEPH B. DE LEE's talking film of the

Forceps Operation, including Episiotomy and its Anatomy

was shown. This film was prepared by Prof. De Lee to demonstrate a method of performing lateral episiotomy which he uses in all primiparæ and in some multiparæ. He believes that it protects the fœtal head and ultimately the pelvic floor. The film showed lateral episiotomy performed on a wax model showing the different layers of tissue involved. The skin and superficial muscles were cut through, and the vaginal wall, the urogenital fascia, and the levator ani muscle. Repair was done very carefully and began high up in the vagina, the separate cut ends of the levator muscle being seized with special forceps. Figure of eight sutures of silkworm gut were used, and the ends tied over a finger to prevent the development of tension. The skin edges were held together for five minutes with special forceps and then released. A finger in the rectum prevented the stitches from going through. The commentary on the film enumerated the indications for forceps intervention. The case demonstrated was a primigravida aged 37 with a fœtus lying in the transverse position arrested in the pelvis. Episiotomy was performed before the application of the forceps or distension of the perineum. Hæmostasis was secured with gauze pads. Manual rotation was performed and forceps applied and a very skilful delivery was demonstrated. The use by each assistant of two retractors with a large rounded blade simplified exposure of the cervix and the stitching up of a minute laceration.

Mr. H. I. MCCLURE (Belfast) read a paper by him and Mr. C. H. G. MACAFEE entitled A Critical Survey of 349 Cases of

Breech Delivery

These breech cases represented 6·03 per cent. of all deliveries in the hospital; in private practice 2·5 per cent. of deliveries were breech presentations. Cæsarean section was performed in 3 of the 349 cases; for the rest the classical method had been used by the resident medical staff. In assessing results they had found that too much emphasis was laid on so-called "complicated breech." They did not regard extension of the legs as a complication, but as almost the rule in primiparous cases; placenta prævia or contracted pelvis were true complications which in this series occurred more frequently in multiparæ. In emergency cases the fœtal mortality was more than double that in those who had had antenatal supervision, whether they were primiparæ or multiparæ. The corrected mortality was 6·1 for all cases, but no maternal death had been attributable to the presentation. There was a morbidity of 15 per cent. of the cases that had been interfered with. Attempts at external version should be made at any time after the 30th week as later the increasing size of the fœtus made the operation more difficult. No anæsthetic was used; the Trendelenburg position was especially useful in cases with extended legs. During delivery there was no interference until the birth of the umbilicus, or until the breech had ceased to advance. An episiotomy was always done in primiparæ, and if necessary in multiparæ. When the arms were extended, it was unnecessary to rotate the head

through the long arc in order to bring down the anterior arm. Besides the disadvantage of the long turn, an occipito-posterior position of the head might result. During the manipulation of short rotation for bringing the anterior arm to the posterior position, the arm could be prevented from coming to lie behind the head by keeping the operator's fingers along it, thus splinting it, and keeping in front of the child's face. The head should be delivered slowly; tentorial tears were a greater danger than was asphyxia.

Prof. D. DOUGAL (Manchester) did not favour rotation through the shortest arc for getting the anterior arm into the posterior position. He himself did not think the breech position a very serious complication but doctors were inclined to be afraid of it. Extended legs should be left unless the breech failed to advance.

Dr. A. E. CHISHOLM (Dundee) had found it useful to apply pads and binders after external version to prevent recurrence of the breech presentation.

Mr. L. CARNAC RIVETT (London) expressed agreement with the principle of leaving the breech alone as long as possible. He did not think episiotomy necessary. He used an anæsthetic for external version whenever he could not do it without one. He thought that the neonatal death-rate was probably higher after breech than after normal deliveries, and that the risks to the mother were definitely greater than in vertex deliveries. In his experience pads were helpful.

Prof. E. C. CRICHTON (Capetown) thought that so many external versions were now performed that students would learn nothing about breech deliveries.

Prof. J. CHASSAR MOIR (Oxford) thought breech deliveries were usually regarded too lightly. Contraction of the pelvis was a serious complication and careful measurements, if necessary supplemented by radiograms, should be taken. He thought a generous episiotomy necessary with any but a very small breech.

Dr. H. R. FREDERICK (Port Talbot) thought the episiotomy demonstrated was an operation too formidable to be undertaken by general practitioners; a simpler technique was necessary for them.

Dr. A. FULLERTON (Batley) said he had his breech cases X rayed, gave them an anæsthetic if necessary for external version, and examined them thoroughly for disproportion at the same time. The cause of breech presentation had not been discovered.

Prof. A. H. DAVIDSON (Dublin) thought contracted pelvis was not a usual cause of breech presentation but if present was likely to cause trouble and might warrant Cæsarean section. He agreed that the legs should be left alone unless the breech failed to advance. He thought external version could be overdone and had seen cases of separation of the placenta and prolapse of the cord attributable to it.

Dr. A. SHERWIN (Melbourne) agreed that extended legs were not really a complication.

The PRESIDENT said he believed in the method of bringing down the second arm described by Drs. McClure and Macafee in the paper. He never gave an anæsthetic for version. No one really knew the cause of the faulty presentation.

Mr. MACAFEE thought that, like the head, if the breech was engaged at the 36th week it was probably safe. He had always found difficulty with the second arm and not the first. Anæsthesia for version encouraged the use of force.

Prof. DAVIDSON showed a coloured film of the operation of *Vaginal Hysterectomy*. It was an easy bloodless operation and left no scar; it caused no shock and no post-operative pain. If necessary the tubes and ovaries could be removed and a plastic operation on the vagina combined with the hysterectomy. It was a quick and safe procedure and he preferred it to radium for treatment of metropathia hæmorrhagica. A low spinal anæsthetic was given after morphia and hyoscine, and the parametrial tissues were infiltrated with adrenaline and Novocain. In 110 cases his mortality had been 0·9 per cent.

In a paper entitled *Posture in Childbirth* Dr. KATHLEEN VAUGHAN (London) pointed out that delivery had taken place in the kneeling, sitting, or squatting position for thousands of years while the lateral decubitus had only been assumed during the last 150 years. If left without help a woman squats for her delivery. In this position said Dr. Vaughan, there is a lengthening of ½–1 cm. in the antero-posterior diameter of the brim and of 2 cm. in the transverse diameter of the outlet. In her opinion the pelvis is the homologue of the thorax and is capable of expansion; in squatting the ischial tuberosities are drawn apart.

Mr. V. B. GREEN-ARMYTAGE (London) congratulated Prof. Davidson on his results and suggested modifications of technique. He regarded Dr. Vaughan's paper as setting a new standard of correct teaching of midwifery.

Dr. F. P. H. BIRTWHISTLE (Barton-on-Humber) agreed with Dr. Vaughan that the squatting position was more natural than the usual position on the side.

SECTION OF PHARMACOLOGY AND THERAPEUTICS, INCLUDING ANÆSTHETICS

THE second meeting of this section, with the vice-president, Prof. DAVID CAMPBELL (Aberdeen), in the chair, was mainly devoted to a discussion on the treatment of

Circulatory Failure

Dr. J. CRIGHTON BRAMWELL (Manchester), in opening the discussion, compared the circulatory system to a pump drawing from a reservoir. With such a mechanism two types of failure were possible: (1) where the pump was inadequate, and (2) when the reservoir ran dry. The two types were represented respectively by heart failure proper, to which he would confine his remarks, and by peripheral failure. The varying demands of the tissues for blood varied between wide limits. In health the cardiac reserve was adequate; indeed, as A. V. Hill had shown, the output might be increased 16 times in exercise, whereas in disease there might be no reserve, the heart being unable to fulfil the demands of the body at rest. The resultant failure was shown by dyspnœa at rest. Between these two extremes all degrees of cardiac inadequacy were found. Structural lesions of the heart limited what he termed the "basal disability," but other factors more capable of mitigation—such as toxic factors, lack of sufficient exercise, and nervous influences—might severely increase the disability.

Dr. Bramwell suggested that the term "heart failure" should be extended to include angina pectoris, for pain limited activity as much as dyspnœa did. He suggested the term "ischæmic failure" as opposed to "congestive failure." The central mechanism of failure and the indications for treatment, he urged, were essentially similar. In treat-

ment complete rest was fundamental. Exercise caused the greatest strain on a weakened heart muscle. Everything must be done for the patient; he must not attempt to assist his nurses. An adjustable bed with proper support was important; an upright posture prevented cardiac asthma, which was often brought on by the patient slipping down in bed during the night. During convalescence graduated exercise and massage were employed to bring the patient back to normal; when convalescence was complete he should remain on a régime calculated to prevent recurrence. Moderation in everything should be the rule; an over-sedentary life was harmful, and the patient should be warned against this as well as told that he must never run for a train or start his car by hand. The nervous aspect of heart failure called for the most careful consideration, especially in the ischæmic type. First, the hypersensitive patient felt pain more acutely and so was more limited in his activities than the phlegmatic type. Secondly, he was more liable to get attacks of pain than his more fortunate brother; his "detonating mechanism" lay dangerously near the surface. Much could be done to reduce the frequency of attacks by the use of cerebral depressants: bromides and luminal. This was the only group of drugs effective when given as a routine. In acute heart failure caused by auricular fibrillation Dr. Bramwell used morphia gr. ¼ hypodermically before the first dose of digitalis. In paroxysmal dyspnœa and acute pulmonary œdema he used the opiates too. It was dangerous to withhold opiates from the cardiac patient. The anxiety factor was best combated by sympathy on the part of the physician. It was wise to allow an anxious subject, who felt that his business was going to pieces, to go back to work as soon as possible. An insufficient coronary circulation was beyond therapeutic measures, but the cardiac reserve could be increased by eliminating subsidiary factors such as obesity, so that the patient might balance his budget by decreasing his liabilities.

Prof. K. D. WILKINSON (Birmingham) spoke of the introduction of digitalis by William Withering some 150 years ago as a more certain diuretic than any then in use. Withering used an infusion of the leaves or the dry powdered leaves. To-day Prof. Wilkinson found digitalis, folium, digoxin, strophanthin, together with the well-known Guy's pill, completely adequate. Overdosage was rare and the signs were well known. Mass dosage might be necessary, but if it was this meant that someone had failed to recognise impending heart failure. Where extremely rapid action was necessary strophanthin could be used intravenously in ¼ mg. doses. This had a rapid action and a correspondingly rapid oxidation so that it was necessary to give strophanthin four hourly for the first day. Digoxin ¼ mg. might be used instead, intravenously, but this had a slower and more prolonged action. In cases of auricular fibrillation Prof. Wilkinson used digitalis pulverata gr. 3–4 daily, or more or less according to requirements. He mentioned that under the digitalis group of drugs the electrocardiogram showed improvement sooner than anything else. Digitalis was the most effective of all drugs in the treatment of heart failure. Wenckebach had said: "I owe my reputation to the fact that I use digitalis in doses the text-books say are dangerous and in cases that the text-books say are unsuitable."

Dr. S. B. BOYD CAMPBELL (Belfast) spoke of peripheral circulatory failure as a subject avoided by most cardiologists, comparatively little being known about it. This was the type of case he was most often called upon to see in surgical wards labelled as "heart failure." Digitalis was useless in its treatment; to use Dr. Bramwell's simile the well had run dry, but the pump was efficient. An attempt must be made to increase the blood volume by administering fluids. Intravenous saline (isotonic) 500 to 1000 c.cm. intravenously was most useful; glucose (5 per cent.) might be added. In very severe cases glucose saline by the continuous drip method might give dramatic results. He had seen apparently hopeless cases recover in three or four days with the drip infusion. He found it clinically useful to add 10 units of insulin to the glucose saline infusion. He mentioned an extremely severe peripheral failure in a patient with thyrotoxicosis who had recovered after receiving 2000 c.cm. of glucose saline with 20 c.cm. of collosol iodine and 20 units of insulin. In private practice drugs must be given as a placebo in these cases, and their mental effect at any rate was good. Strychnine, caffeine and sodium benzoate, and Coramine were the drugs he used personally—they were possibly of some help.

In heart failure Dr. Boyd Campbell found venesection of extreme value in cyanosed patients. He quoted illustrative cases of patients who resisted therapy till 500 c.cm. of blood were drawn off. Venesection should be followed by a course of Guy's pills. Acupuncture of the legs was often effective in œdematous cases where digitalis had failed, and the practitioner should not be afraid of this method of treatment. Pleural effusions should be treated with respect, the rule being to take very little fluid off, and that very slowly. Dr. Boyd Campbell praised the mercurial diuretics, Salyrgan and Novurit. His own practice was to give 2 c.cm. of salyrgan intravenously daily for as long as might be required. Ammonium chloride was unnecessary as an adjunct.

Dr. A. R. GILCHRIST (Edinburgh) spoke of the dietetic side of treatment. The circulation was a sensitive index of the state of nutrition, being embarrassed by under-nutrition as in anorexia nervosa, and, much more commonly, by over-nutrition as in obesity. Doctors did not as a rule weigh their patients often enough. Even one stone overweight was of tremendous import to a cardiac patient. A definite diet sheet with quantities should be given; it was no use just telling a patient to eat less. An average loss of 2 lb. per week after a loss of 3–5 lb. in the first week was a quick enough reduction. Thyroid was better avoided as it increased the strain on the heart. In one case of angina known to Dr. Gilchrist the patient was able to go back to work following three years of incapacitating illness after dietetic treatment alone, which brought his weight from 17 st. to 9 st. 4 lb. In congestive failure a suitable diet was 1200 to 1500 calories, with total fluid 1000 c.cm. (milk, water, oranges) taken in seven small feeds during the day. This diet should be practically salt-free, since sodium chloride had been found to counteract the action of digitalis. An adequate supply of vitamins was important.

Dr. E. P. POULTON (London) dealt with treatment by oxygen. He showed the results of several experiments to illustrate that an increased atmospheric pressure lessened the blood content of the thorax and diminished pulmonary œdema. The type of case suitable for oxygen treatment was one of definite left-sided failure of the heart with cardiac asthma or pulmonary œdema. He instanced a case where left-sided preponderance had developed following oxygen treatment. Arterio-sclerotic patients and those with angina and coronary lesions also responded

well. Of the available methods, the closed-top tent was the most useful, but it was unfortunately expensive. Open-top tents were more uncertain, as was also mask administration, and the nasal catheter. A disadvantage of closed-top tents was that the humidity often rose to uncomfortable heights.

Dr. GEORGE GRAHAM (London) suggested that pulmonary œdema was due to spasm of the pulmonary veins and advocated adrenaline in doses of between ♏ 15 and ½ c.cm. in these cases. It was important to make sure that the needle did not enter a vein; apart from this, doses could be given safely intramuscularly in pulmonary œdema and cardiac asthma.

The PRESIDENT said he had been disappointed not to hear more of the speakers touch on peripheral failure; there must, however, be a time lag between the pharmacological classification of new drugs and their clinical application.

Others taking part in the discussion included Dr. A. FULLERTON (Batley), Prof. J. H. GADDUM (London), Dr. A. KEY (Portsmouth), and Dr. J. F. COLTMAN (Calcutta), who recommended Pitressin in peripheral failure as well as fluids, the amount of these being controlled by the specific gravity of the blood.

Dr. NATHAN MUTCH (London) read a paper on the

Therapeutic Uses of Magnesium Trisilicate

In his experiments he used a substance having the formula $H_4Mg_2Si_3O_{10}$ and a diffraction radiogram the same as that of pure synthetic Sepiolite No. 1. He deplored the fact that commercial preparations do not always accord with this formula. The pure substance had an antacid potency of 1 : 300, a prolonged and slow action, and strong adsorptive properties. It had no deleterious clinical properties even in large overdoses and did not cause alkalosis. It could be used for reduction of hyperacidity, for the production of complete anacidity without alkalosis, and for its adsorptive properties in hypochlorhydric gastritis.

In reply to Dr. E. P. POULTON the speaker said he was not pressing the claims of the substance as a cure for peptic ulcer, but only as a means of controlling acidity if this were considered necessary.

REVIEWS AND NOTICES OF BOOKS

Drug Addiction

By E. W. ADAMS, O.B.E., M.D., a Medical Officer of the Ministry of Health; late Lecturer on Pharmacology and Therapeutics, University of Sheffield. London: Humphrey Milford, Oxford University Press. 1937. Pp. 173. 8*s.* 6*d.*

A DRUG addict suggests to many a vicious and rather disgusting person who, however wretched his condition may be, has brought it upon his own head. Of late years, however, it is being more and more realised that the addict is as much a sick man as is a sufferer from tuberculosis, and often is no more to blame for his affliction. This change of view is reflected in the extensive efforts at mass treatment that are being made in parts of the world where addiction is common, especially in China, Egypt, and the United States. In this country our drug problem is a small-scale one. In 1935 our known addicts numbered only 700, against more than 100,000 in the United States, so that a practitioner here may well pass his professional life without coming into contact with one of these unfortunates, and may dismiss the problem as outside his sphere. Dr. Adams has no such illusions, for he tells us that one-sixth of known British addicts are medical men, and of the rest many owe their plight to the unwise prescription of narcotic drugs by their family doctor. Dr. Adams, who was secretary of the Ministry of Health committee on morphine and heroin addiction, defines addiction as "a state of bondage to a masterful drug, usually but not always of the narcotic class, manifested by craving, tolerance, intense discomfort of a specialised character on withdrawal of the drug, and tendency to relapse." He divides the narcotic drugs into vegetable and chemical, of which the former, which includes opium, coca, and cannabis, and their ever-increasing manufactured products, are the subject of this treatise. He shows in an historical survey that in Europe, at any rate, the problem began to be serious only after the introduction of morphine in 1804 and of the hypodermic syringe in the 1850's. This survey proves that it takes a long time to size up a new drug accurately; a claim that any drug does not cause addiction should be received with extreme caution, seeing that heroin was originally introduced as a harmless substitute for morphine, and that the hopes held out for the newer preparations, dicodid, dilaudid, and so forth have each been dashed in turn. Dr. Adams shows that addiction affects mainly young male adults, mostly psychopaths, though probably even a normal person may be made an addict by injudicious medication. Worry and anxiety are exciting causes, and opportunity and contagion play their part.

Dr. Adams summarises the various theories advanced to explain the phenomena of tolerance and the abstinence syndrome, and though he has done his best to simplify the theories, this is the one part of the book which the general reader may find heavy going. The prognosis of the condition, which he holds to be still bad, is influenced by the type of case, its duration, the particular narcotic used, the mode of administration, and the patient's environment. He describes a number of methods of "disintoxication," involving abrupt, rapid, or gradual withdrawal of the drug, many of which proved highly successful when first used by enthusiasts and less so when used later by the more sceptical; but the main difficulty lies in the rehabilitation of the patient. Various large-scale attempts at prevention are being made by the health section of the League of Nations and other authorities, and intensive search is being made for a morphine substitute that will not carry the danger of addiction. Meanwhile the practitioner can play his part by using pain-relieving drugs other than opium whenever possible, by never entrusting a patient with a hypodermic syringe, by caution in ordering narcotics for unstable persons, and by treating efficiently those functional nervous and physical disorders that may predispose to addiction.

Blackwater Fever

A Historical Survey and Summary of Observations made over a Century. By J. W. W. STEPHENS, M.D., F.R.S., Professor Emeritus of Tropical Medicine, University of Liverpool. University Press of Liverpool; London: Hodder and Stoughton. 1937. Pp. 727. 15*s.*

THIS is a compendium of data on blackwater fever published during the past hundred years which should prove of great value to present and future

investigators of this subject. Three-quarters of the volume is devoted to considerations of synonymy, history, geographical distribution, ætiology, pathology, symptomatology, and treatment. Relevant information is arranged in chronological sequence, and useful tables summarise the observations of different workers on many aspects of the disease. The other part consists of a series of appendices which deal, amongst other matters, with the discovery of cinchona bark and its introduction into Europe. The work concludes with an extensive bibliography.

Comparative figures indicating the frequency of blackwater fever in different countries are unfortunately not available, but Bulgaria, Greece, Italy, Sicily, Russia, and Yugoslavia are described as places in Europe where "blackwater fever is not an unusual condition." Prof. Stephens points out that though cases of "blackwater urines" recorded by Hippocrates are regarded by some as examples of blackwater fever, they do not appear to bear the stamp of that condition. The modern history begins in 1858 when Antoniades referred to hæmaturia as a common symptom in intermittent fever following malaria.

Those who have studied the literature of this disease will agree with Prof. Stephens that until the conflicting mass of statements are harmonised by more precise observation and by the use of modern methods of investigation a complete and accurate epitome of blackwater fever cannot be given.

Annual Review of Biochemistry

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THE annual appearance of this review continues to be an event. All the sections are as usual written by specialists and provide, also as usual, the best available description of that particular subject. The date on which the article was received is supplied so that the reader can tell at a glance the exact extent of knowledge at a time which is mostly as recent as the early part of the year of issue. A wide variety of biochemical subjects is discussed. The section on the hormones by G. F. Marrian and G. C. Butler is particularly refreshing in that it goes beyond the ordinary literature on the sex hormones; the greater part of the article is devoted to recent work on the cortical hormone and the gonadotropic hormone of the anterior lobe of the pituitary. There is also an excellent section on antihormones. C. C. and H. C. Sherman bring the work on vitamin B up to date, and an unusually interesting article on the biochemistry of fish is included. Throughout the book the high standard of previous issues is maintained.

Administrative Psychiatry

By WILLIAM A. BRYAN, M.D., Superintendent, Worcester State Hospital, Mass. London: George Allen and Unwin. 1937. Pp. 349. 15*s*.

LITTLE has been written about this rather despised but actually most onerous, exacting, and important branch of psychiatric work; this book would therefore be of interest, even if it were less thoughtful, clear, and practical. Dr. Bryan has a high, one might say an aspiring, view of what administrative psychiatry can be and his ideas are based on long experience. After an historical survey and a description of the various forms of control of mental hospitals, he goes on to consider how a staff may be built up, paying special attention to the nursing problem and the standards of care for the somatic as well as the mental disorders of the patients. The organisation of treatment is discussed in three chapters, dealing in a very detailed way with group psychotherapy, occupational and industrial therapy, and the social worker's contribution. In setting this out, Dr. Bryan shows occasionally an undue partiality for the minutely classified arrangement of plans and duties; but such orderly procedure in exposition is no doubt only another sign of the precision of thought which is characteristic of one type of good administrator. In the following chapters teaching, coördinated research, and the organisation of a child guidance clinic geographically separate from the hospital are the chief topics. The book concludes with stimulating chapters on the relationships of the mental hospital with the public, and the possibilities of future development.

Diabetes

A Modern Manual. By ANTHONY M. SINDONI, Jun., M.D., Chief of the Diseases of Metabolism at the St. Agnes Hospital; Chief Consultant in the Diseases of Metabolism at the Oncologic Hospital; Physician to the Medical Dispensary of Presbyterian Hospital, Philadelphia. London: McGraw-Hill Publishing Company. 1937. Pp. 240. 8*s*. 6*d*.

THIS book is unusual. The first part is devoted to a series of questions by patients and answers by the doctor. These questions are sensible and the answers sound, and they relate to problems which physicians treating diabetics have to face sooner or later. The second part, entitled "What to know," gives a very good account of the incidence, symptoms, diagnosis, and treatment of diabetes. Treatment with diet alone, ordinary insulin, and the complications are carefully described. The actions of the new slow-acting insulins, Retard and protamine zinc, are discussed in a simple way which should help both physicians and patients to understand their advantages and drawbacks. The instructions for the actual injection of insulin are good, but the surprising advice is given that the syringe should be boiled every day. If the syringe is kept in surgical or industrial spirit it is quite unnecessary to boil it. A common mistake is made in describing the nitroprusside test as one for acetone, whereas it is far more sensitive to aceto-acetic acid. The food tables are elaborate; they give the percentage composition instead of following the English practice of giving the different weights of food which contain 5 g. of carbohydrate. The recipes are rather scanty. The final section, entitled "What to do," gives sound instructions for action in various emergencies.

Organization, Strategy and Tactics of the Army Medical Services in War

By T. B. NICHOLLS, M.B., Ch.B., Lieut.-Colonel, R.A.M.C. London: Baillière, Tindall and Cox. 1937. Pp. 386. 10*s*. 6*d*.

AS Sir James Hartigan says in his foreword, an officer of the R.A.M.C. who wishes to study the problems he may meet in war or in his examinations for promotion has to extract the information required from many sources. This is not necessarily a bad thing, since it drives the student to go back to originals, but much may be missed in the process and it is discouraging to those who are "slow studies."

In this important book Colonel Nicholls has attempted to collate the relevant facts and theories and the result has the approval of the Director-General, who "unhesitatingly recommends it to all regular and territorial R.A.M.C. officers."

The book is in four parts: I deals with the organisation and administration of the army in general; II with the constitution and organisation of medical units; III with strategy (10 pages) and tactics (20 pages); and IV gives seven problems, five of which are provided with solutions. A minor criticism is that the style of writing is awkward, particularly in the earlier parts of the book, and the meaning is not always made clear. The book is practical rather than profound and consists chiefly of lists and summaries, with an occasional (excellent) aphorism: references to incidents illustrating the points under discussion might well have been more numerous. More serious is the impression left on the reader's mind that the author is looking back to the experiences of past wars rather than forward to future ones. This impression is supported by the omission of adequate reference to aircraft in the text. The index appears to omit it altogether.

Clinical Laboratory Diagnosis

By SAMUEL A. LEVINSON, M.S., M.D., Director of Laboratories, Research and Educational Hospitals, Chicago, Illinois; Associate Professor of Pathology and Bacteriology and Assistant Professor of Medicine, University of Illinois College of Medicine; and ROBERT P. MACFATE, Ch.E., M.S., Assistant Director of the Laboratories; Associate in Pathology and Bacteriology and Instructor of Physiological Chemistry at the University. London: Henry Kimpton. 1937. Pp. 877. 45*s*.

THIS book represents the teaching in a course of clinical pathology which has been given for some years at the University of Illinois College of Medicine. It attempts to cover the whole field of laboratory diagnosis in terms that will be understandable to the student, physician, and technician. The several sections of the alimentary tract, the viscera, the body fluids, basal metabolism, and hæmatology are discussed in separate chapters. There are sections on immunology, general bacteriology and histology, with special chapters on pædiatric procedures, on milk and water analysis, and forensic medicine. The authors aim also to include an account of the fundamentals of the sciences ancillary to the study of medicine sufficient to furnish a background for the study of pathological processes, and they provide short descriptions of the outstanding diseases.

The general plan of the book is good, but the space devoted to the different parts of each section is not well balanced. For example, two-thirds of the serology is devoted to tests for syphilis, while in the notes on the serology of the typhoid-dysentery group of organisms no mention is made of antigenic variability and complexity in the group. There is a 22-page chart of the characteristics of common bacteria, but the student will find little or no indication of which features are of differential importance in this welter of facts. The recent work on hæmolytic streptococci is not included, but in another section four pages are devoted to the diagnosis of eight types of pneumococci in sputum. In the 114 pages on hæmatology, parasites of the blood, and physical signs and symptoms of diseases as well as technical procedures are included, while many more strictly hæmatological facts are omitted. In some places single figures are given for normal values, which in practice cover a wide range; in other places the normal levels quoted vary from page to page. The retention of the obsolete system of dividing the anæmias into primary and secondary only leads to confusion, and the illustrations of blood diseases, though numerous, are not good enough.

A considerable part of the book is devoted to biochemical methods, mostly standard procedures used in clinical laboratories throughout the world. The Folin-Wu system has been largely adopted for blood analysis. Several biochemical investigations rarely conducted and of doubtful clinical value have been included, while no mention is made of important determinations such as plasma phosphatase in the study of bone disease and jaundice. Some of the methods given are out of date—e.g., the thiocyanate method for iron. Some of the tests put forward are of questionable value; for example, the microscopic test for silicosis on page 759 is not a satisfactory method of distinguishing dust fibrosis from inflammatory fibrosis.

The book in fact has its uses—as a background to a course of lectures—but it suffers from the difficulties common to attempts to coördinate in a single volume the several medical sciences which contribute to the study of pathological processes. The greater part of the text is devoted to technical procedures, and there is no room in the remainder to distinguish controversial from accepted theories.

Surgical Treatment

Second edition. By J. P. WARBASSE, M.D., F.A.C.S., Special Lecturer in the Long Island Medical College; and C. MASON SMYTH, Jun., B.S., M.D., F.A.C.S., Assistant Professor of Surgery in the University of Pennsylvania. London: W. B. Saunders Co. 1937. Three vols. Pp. 2486. £7 7*s*.

THESE massive volumes have been compiled "in the interest of the surgical patient," but it is not quite clear whether they are intended to instruct the student, the surgeon, or the hospital administrator. They deal at length with the planning of operation theatres and with the problems of their ventilation and equipment, and at the other extreme we find chapters devoted to first-aid and bandaging. Such matters, which may be understood by a layman interested in hospital management, are mingled with the accumulated experience of two general surgeons in a fashion which suggests that the authors have noted down their impressions of surgical problems as they occurred and have now published them, without any abbreviation or selection, in book form. It follows therefore that the work is full of redundancies, and that little distinction is drawn between the major and minor problems. Methods long obsolete are included without any indication that they are merely of historical interest, and only the expert can choose, from the large number of operations described, the best surgical treatment for any given disease. There are numerous anatomical errors, and the views of the authors on the pathology of many surgical conditions are out of keeping with modern teaching. As there are no bibliographical references it is impossible to discover the authorities upon which these views are based, and it is manifest that it has not been possible under the circumstances to keep this large undertaking up to date. The book is unreliable as a guide to those starting surgical practice, and it is doubtful whether it has anything to offer to surgeons of experience.

THE LANCET

LONDON: SATURDAY, SEPTEMBER 11, 1937

CONTINUITY IN ORTHOPÆDICS

THOUGH there are still a number of local education authorities who have failed to make proper provision for the care of crippling defects, the extent to which orthopædic work has developed in recent years is encouraging in so far as children are concerned. In 1935 some sort of provision had been made in 245 areas, 71 remaining negligent in this respect. No doubt the returns for 1936 will show fewer defaulters. There are, it seems,[1] as many as nine different ways in which an orthopædic scheme may be conducted; the scope and efficiency of any scheme, however, must be ultimately determined by the legislation behind it. The merits and faults of the law as it stands are seen most clearly in orthopædic clinics organised and maintained by a local education authority. Children are referred to the clinic by school medical officers and also (in nearly all cases) by infant welfare officers as well. An orthopædic surgeon visits the clinic regularly to examine patients, to supervise the treatment there given, and to recommend the admission to hospital of the more serious cases. So far as it goes such a clinic works well; but it has serious limitations, of which the most obvious is the lapse of the local authority's responsibility when a child leaves school. This leads to certain difficulties to which Mr. H. J. SEDDON refers [2] in his report for 1936 on the work at the Willesden orthopædic centre. He points out that in a small group of cases observation should be continued long after completion of treatment. Congenital dislocation of the hip is a good example. The dislocation may have been reduced to the surgeon's satisfaction at the age of two, the child may be walking well at five and at ten; but how is his hip behaving when he is fifteen or twenty? Such prolonged observation is not merely of academic interest; it might, and probably would, lead to improvement in methods, though it would be too late to apply this knowledge retrospectively to the individual patient. Another group is in need of continuous observation during the 12–20 age-period—we have in mind especially infantile paralysis and scoliosis; the treatment of these conditions cannot be brought within any legal time limit. Continuity of supervision is one of the most important factors in every branch of successful orthopædic practice and though admittedly the groups of cases specified above form a small proportion of those attending the clinic, it is unfortunate for the victims that the present organisation does not allow this principle of continuity to be carried to its logical conclusion.

But there is a greater defect in the organisation. The orthopædic clinic is only open to children attending a welfare centre or a public elementary school; other municipal services, such as provision for the treatment of tuberculosis and for vaccination, the fever and maternity hospitals and V.D. clinics, are available for all ratepayers. The solution of the particular evils to which Mr. SEDDON has properly drawn attention should be amenable to the broad principle which has been successful in a neighbouring field. Tuberculous disease, whatever the site of the lesion or the age of the patient, is recognised by the State for purposes of treatment. The principle is the same whether the disease is or is not pulmonary; for our present argument tuberculous disease of the joints is most instructive. An orthopædic surgeon attends a clinic in a county borough, which is a recognised authority for treating tuberculosis. He sees cases of joint tuberculosis side by side with ordinary orthopædic cases. Among the first group he is free to treat or follow up a case to any age; in the second, official recognition ceases the moment the child leaves school. True, a post-school patient may be dealt with, so far as payment for treatment is concerned, under public assistance, but this entails the drawback that every case has to be considered by the committee on its merits. Why should not non-tuberculous crippling diseases be put on the same footing as the other conditions that we have just enumerated? A cripple may not be a menace to society like the patient with pulmonary tuberculosis or venereal disease—but neither for that matter is the patient with a tuberculous joint. He is, however, often a burden to society, to his family and to himself; financially too a persistent burden, for his disease does not as a rule diminish his expectation of life.

The logical step would be to extend official supervision to the crippled or maimed of all ages, not forgetting the manifold forms of arthritis. It will be objected that the cost would be prohibitive. But someone is paying already for the maintenance of people crippled through lack of adequate treatment, or for treatment that is not properly equipped and organised. Efficient handling of children has already banished the more gross crippling defects, and long periods of hospital treatment are becoming less necessary. Such expenditure has come to be regarded as a long-term investment, and for young adults the term would still be long. The cost would be diminished by the fact, of which they need no reminder, that local authorities are at liberty to recover part or all of the money spent on treatment from the patient himself or from his family. Whatever may be the derivation of the word orthopædics—and no word in the medical vocabulary has been more misunderstood—the orthopædic hospital and the orthopædic surgeon have long ceased to limit their activities to straightening children. Orthopædics has grown up and the State would do well to recognise its majority.

[1] The Health of the School Child: Annual Report of the Chief Medical Officer of the Board of Education, 1935. H.M. Stat. Office. Pp. 98.
[2] Annual Report of the Medical Officer of Health for Willesden, 1936, Appendix F.

FOOD AND THE WOMAN

THE British Commonwealth League, in conference at Westminster last May, accepted a resolution that it "views with apprehension the fallacious opinion that any woman needs less food than any man" and demanded that "in all tables drawn up in relation to public nutrition the adequate allowance suggested shall not be less for any adult woman than for any adult man." The supreme importance of good nutrition for women is beyond question—it is in fact coming to be regarded as the first step in preventive medicine; but the conclusion that equal quantities of food are necessarily required by the two sexes is not supported by the experimental evidence now available. Caloric requirements depend on the person's basal metabolic rate and on the additional expenditure for any activity, and may be computed accordingly. Thus for a man between twenty and thirty years old the basal requirements are normally 948 calories per square metre of body surface per day; for a woman they are 888. When allowance has been made for their greater average size men are a little ahead on basal requirements. Then there are accepted figures for the additional requirements when the subject sits, stands in various postures, walks at various speeds, works or eats, and for the metabolism during sleep which is about 90 per cent. of the basal level. The calculation for a day's energy requirements for a man may run like this: [1]

Basal metabolism (16 hours)	..	1152 calories.
Metabolism of sleep (8 hours)	..	518 ,,
Allowance for light work ..	..	1200 ,,
Total		2870 calories.
Add six per cent. for specific dynamic action of food		3042 ,,

The extra calories per hour for different occupations vary considerably. For instance, they have been found to be for a tailor 44, for a seamstress 6, for a man bookbinder 81 and for a woman 63, for a housemaid working hard 157, for a man sawing wood 378. Assuming eight hours of work a day, the tailor comes out at 2144 calories per day altogether and the man sawing wood at 4800. Other occupations might be intermediate and clearly for some women the severity of the work would easily outweigh their slighter basal requirements and bring them ahead of some men: the demands for energy of the wife engaged in ordinary household duties, scrubbing and so forth, may be greater than those of her husband if his is a sedentary job. The fact remains, however, that on average a woman's requirements are less than a man's, the smaller physique and lower metabolic rate being part and parcel of the differences in the make-up of the sexes: the requirements of a woman are thought to be on average about 17 per cent. less than those of a man.

There seems therefore to be ample justification for the smaller allowance for women made in most tables of energy requirements, although the differentiation may seem unnecessary when the assessments of total requirements vary so widely. It may be for this reason that the League of Nations' technical committee gives only the one figure—2400 calories per day—for an adult, man or woman, not engaged in manual work. If the cost of the food required rather than the number of calories had been considered then the claim for equality would have stood firmer, for it is likely that the need of protective foods is as great for a woman as for a man. The purchase of the extra energy-bearing items should make relatively little difference to the week's budget.

[1] Physiological Basis of Medical Practice. By C. H. Best and N. B. Taylor. 1937, p. 1044.

THE PROPHYLACTIC VACCINATION OF CALVES WITH B C G

NUMEROUS attempts have been made during the last six or seven years to vaccinate calves with B C G. In this country BUXTON and GRIFFITH [1] made a series of experiments, the account of which was continued by GRIFFITH, BUXTON, and GLOVER.[2] These workers obtained by previous intravenous inoculation complete immunity against tuberculous infection by mouth, but found considerable variation in the duration of the immunity. Under the conditions of their experiments the duration of absolute immunity ranged from nearly six months up to more than a year. Revaccination restored it but complete protection was obtained in a smaller proportion of calves than after primary vaccination. Prof. A. ASCOLI of Milan published a record [3] about the same time as the original British investigation. More than 5000 cattle, including 1500 calves, were vaccinated with B C G under carefully controlled conditions without any untoward effects. A monograph reporting a new series of experiments on calves, made under his control, and presented to the Italian National Council of Research, has now reached us.[4] The investigations were carried out on 94 calves distributed over six different agricultural establishments in the province of Pavia. In five experiments the test doses of the vaccinated calves and of the controls were carried out by means of intravenous injections of various doses of virulent bovine bacilli and in two the test dose was the natural one of cohabitation of the calves under experiment with animals suffering from open pulmonary tuberculosis. Lastly, a test was made in which vaccinated animals were kept on a farm where natural tuberculous infection prevailed in the cowshed. It was found that intravenous and subcutaneous vaccination with B C G as well as with bacilli of the human strain conferred on the animals a substantial degree of resistance, but, as in the case of the British experiments, the immunity produced proved not to be permanent. This is, after all, the usual experience with prophylactic vaccines of bacteria in other diseases. Vaccination with heat-killed organisms

[1] Buxton and Griffith, *Lancet*, 1931, **1**, 393.
[2] Griffith, Buxton, and Glover, *Ibid*, 1935, **1**, 451.
[3] Ascoli, A., *Ann. Inst. Pasteur*, 1931, **47**, 29.
[4] Ascoli, A., Esperimenti di Vaccinazione Antitubercolase, Institut di Patalogia comparata della Regia Università di Milano, 1936.

was not a success; indeed, the results of intravenous inoculation of such vaccines in large doses gave reason to think that the remedy was worse than useless, the vaccine exercising a predisposing rather than a protective effect.

There is now a considerable amount of evidence to show that calves can be protected for a period extending to a year, or even more, by vaccines of tubercle bacilli. The insuperable difficulty at the moment lies in successful revaccination. Initial vaccination of the young calf should be a valuable economic proposition if it can be made reliable for routine use, but the essential task for the dairying industry is the protection of the cow during the later years when she is producing milk. So far this difficulty has not been surmounted.

ANNOTATIONS

A NEUROLOGIST'S AUTOBIOGRAPHY

Too many medical men in this country know nothing of Ramon y Cajal except his name, usually mispronounced, coupled with methods for staining axis-cylinders and neuroglia. But these, though important, were chance achievements. His fame is based on the more stable foundations of a multitude of brilliant discoveries related to the structure of the nervous system. His most important book, unfortunately scarce and too little known in either the Spanish or the French edition, was practically completed before he discovered his method for impregnating axis-cylinders with silver nitrate. It was, as he tells us,[1] the result of fifteen years of solitary work on the nervous system of newly born animals using a modification of Golgi's silver bichromate method. It stands to-day, more than 30 years after its publication, as the most reliable and complete description of the microscopic anatomy of the central nervous system. The first (Spanish) edition, limited to 800 copies, resulted in a loss to the author of 3000 pesetas, or nearly as much as his annual salary as a professor of histology. His later important book, on degeneration and regeneration in the central nervous system, which has recently been translated into English, was paid for by South American admirers. Both these books are crowded with original observations. Cajal was the first to demonstrate the unity of the nerve-cell from its dendrites to the termination of its axis-cylinder and to show the polarity of the neuron. (Waldeyer merely popularised the work and gave the name "neuron" to the theory.) It was Cajal who discovered the basket cells and the finer structure of the cerebellar cortex, the pericellular network to which Golgi's name was later given, as well as other details of nervous histology too numerous to mention. His later work on degeneration and regeneration in the nervous system was undertaken finally to disprove the catenary theory of nerve regeneration which at that time had become undeservedly popular. Thus out of evil came good, in that many details of the regeneration of axis-cylinders and nerves were brought to light which are of the utmost importance in neuropathology. Outside the field of neurology Cajal discovered the plasma cell, and did important work on the bacteriology of cholera. But his inventive genius was not content with microscopic technique and structure. He was one of the pioneers of photography, and at one time supplemented his income by sensitising photographic plates for amateurs in his neighbourhood. Later he did much experimental work in colour photography, and wrote a text-book on its theory and practice. And he tells us how, on his visit to the United States, he found, newly put on the market, the disc-record gramophone which he had invented and tried to perfect many years before—a reminder, he says, that "the cobbler should stick to his last," seeing that without skilled technical help such inventions can never come to fruition.

For those interested in the man rather than his work the first volume, tracing his boyhood up to his marriage, will provide the best reading. His ambition and enthusiasm lay altogether in pictorial art, and owing perhaps to parental obstruction of this outlet for his interests, Cajal became the bad boy not only of the family but of the village. He was sent away to a school where the discipline was so severe that his parents became anxious for his health under a régime of starvation and thrashing. His career as a medical student was undistinguished except for his anatomical drawings and his devotion to physical culture. He tells several stories of his extraordinary physical strength at this time, but this was lost to him soon after his graduation, as a result of the dysentery and malaria in Cuba from which he nearly died. Later he found that physical exercise diminished his mental output and he suffered from many of the bodily ailments commonly experienced by those who make no attempt to balance intense mental work with recreative physical exercise. It is clear that it was the artist's eye and hand that determined his choice of histology as a career, but that he brought to this much more than mere artistic talent is evident in every chapter.

The task of rendering the florid Spanish style into English which preserves its idiom and savour can have been no easy one; for his piety and skill we owe Dr. Craigie and his collaborator in translation a debt of gratitude. Cajal's meteoric career, his remarkable achievements, his fine philosophy, and his modesty make his autobiography one of unusual interest and charm.

[1] Recollections of My Life. By Santiago Ramon y Cajal. Translated by E. Horne Craigie, with the assistance of Juan Cano. Memoirs of the American Philosophical Society, Philadelphia. London: Humphrey Milford, Oxford University Press. 1937. Vol. VIII. Two Parts. Pp. 638. 22*s*. 6*d*.

ACCLIMATISATION TO ALTITUDE

A RECENT communication from the Lasker foundation of the University of Chicago draws attention opportunely to our ignorance of the mechanism of acclimatisation to great altitude. There have been occasions in the past when momentarily all seemed clear. The red cell count rises, the oxygen-carrying capacity of the blood is thereby increased and you have your explanation—until it is found that some people acclimatise well with but a slight, and others badly with a great, increase. J. S. Haldane and his colleagues appeared to have solved the main part of the problem with their masterly description of the changes which occur in the alveolar air, and out of this work arose the suggestion that the process of acclimatisation might be accelerated by eating ammonium chloride and thus, by diminishing the available alkali, raising the alveolar oxygen pressure. The suggestion was taken up in several communications by Raymond Greene, who administered the salt on Kamet and Everest. In 1933 Douglas,

Raymond Greene, and Kergin, working in a steel chamber at an "altitude" of 20,000–22,000 feet, showed that the alveolar oxygen pressure is in fact raised by the administration of ammonium chloride. The subject of their experiments showed also lessened cyanosis, a slower pulse-rate, and an increased capacity for muscular work. Now, however, Barron and his colleagues [1] bring forward evidence which, while confirming this work, suggests that the onset of mountain sickness is not dependent simply on arterial oxygen saturation. Their conclusions apply only to acute mountain sickness and to non-acclimatised persons. They administered ammonium chloride to 6 out of 12 men proceeding by motor-car to an altitude of 4740 metres; 3 of those who took the salt, and only 2 of those who did not suffered from mountain sickness, in spite of the fact that the former group had achieved a reduction in available alkali roughly equal to that established after partial acclimatisation to about 5000 metres. Barron and his colleagues make only passing reference to the unpleasant gastric effects of ammonium chloride; these effects deserve more careful consideration for they may have an important bearing on the results of the tests. It would have been better to use acid ammonium phosphate as suggested by Porges, for the phosphate has a far less irritating action on the gastric mucosa. The work should obviously be repeated if possible with greater numbers. It may not be too late, if funds were available, to arrange for a scientific expedition to accompany the Everest expedition planned for 1938. An opportunity of working in comparative comfort at an altitude of 20,000 feet, with a chance of experimental work at much greater altitudes, should not be missed, for should the expedition be successful such an opportunity may not recur.

ANXIETY AS A FACTOR IN MANIA

FOLLOWING an urge to simplify which makes for easy thinking and teaching, psychiatrists tend to differentiate a group of constitutional non-psychogenic psychoses from another group of disorders which are deemed psychogenic and respond to psychological treatment. Mania, especially when it is recurrent or alternates with melancholy, is put into the first category and the neuroses into the second. Simple notions may prove to be right, but sharp contrasts seldom do, least of all in psychiatry. Mania has long been regarded as the most undeniably endogenous of mental disorders, but as Dr. Nils Anthonisen has lately emphasised afresh,[2] the outbreak of a maniacal illness is by no means independent of external "psychogenic" situations, any more than neuroses develop without a big constitutional background. In a number of cases which he brings forward, and to which any psychiatrist of experience could add, the manic attack could be recognised as not only the expression of hereditary tendencies but also as a reaction to a complicated situation. He concludes that anxiety, together with a drive to overcome these disturbing factors, is the motivating force during the whole attack; certainly study of any maniacal patient reveals that he is anxious, easily angered, and far from the state of unalloyed happiness which he may loudly profess. Indeed, that other sharp contrast so often made—between mania and depression—cannot stand, in the face of any careful analysis of the kindred symptoms in these two aspects of the same affective disorder. Dr. Anthonisen also puts forward grounds for doubting the usual explanation for the form of the psychotic episode, namely, that it is manic if the patient is exposed to a traumatic situation when on the "upgrade," and depressive if he is in the downward cyclic phase; he holds that the "situational" factors may determine whether the illness is to be a manic or a depressive one. If the difficulties are such that there is hope of overcoming them, the patient's initiative may be aroused, though with some anxiety about the outcome of his trouble, and a manic attack, the resultant of aggression and anxiety, may ensue. This is more debatable matter. The psychopathology of the manic attack does not lend colour to Dr. Anthonisen's dynamic interpretation of its form; often the hopefulness of a manic patient does not become evident until after the prodromal phase is past, and it may be little more than a deceptive façade, not only for anxiety but also for self-distrust and even hypochondriasis and self-blame. Such an inquiry as this of Dr. Anthonisen has undoubted value. It is true that mania, in its "pure" form, is rare, but fuller study of the clinical and psychological features of the illness may shed light also on the commoner mixed forms and hypomanic attacks, as well as on that hypomanic or exuberant type of personality which is so often the mainspring of an active and unusually productive life.

[1] Barron, E. S. G., Dill, D. B., Edwards, H. T., and Hurtado, A., *J. clin. Invest.* July, 1937, p. 541.
[2] Anthonisen, N. L., *Arch. Neurol. Psychiat. Lond.* 1937, 38, 71.

MEDICAL RESEARCH IN SHANGHAI

THE Henry Lester Institute of Medical Research in Shanghai has now completed its third full year of work. In its recent report Dr. J. L. Maxwell reviews the changes in China's health problems which he has seen since he went out in 1900. Starting with leprosy, during that period Sir Leonard Rogers has developed the treatment with chaulmoogra, and the part played in its causation by concurrent diseases, unhealthy habits of life, and nutritional defects has been increasingly recognised—very different from the days when segregation was the only treatment known. The introduction of emetine has revolutionised the outlook in amœbic dysentery. The prevalence of the common helminths has only been realised since the research committee of the China Medical Association began its investigations in 1907. Curiously enough, while cleanliness and water-supplies have vastly improved along the coast and in the inland towns, typhoid fever, which thirty years ago was a rarity among the Chinese population, has become one of the commonest causes of admission to the hospitals and at the top of the list of deaths from infections. Why this should be is at present obscure. Progress has been made in the development of a new curative antityphoid serum, which has been supplied to hospitals in all parts of China. Appendicitis has much increased, more particularly in the wealthy city population, possibly from changes in their diet. During the last 25 years a licentious soldiery has overrun the countryside and has raised the incidence of neurosyphilis, both by spreading infection and, according to Dr. Maxwell, by inducing a state of nervous strain in the rural population. Scarlet fever has been found to be widely distributed, especially in the north, and to affect mainly adolescents. Studies of dietetic defects and nutritional diseases have been carried out in the rural districts and among the increasing number of factory workers in the town. Of the younger factory workers more than half showed signs of malnutrition, mainly from a lack of animal fats and first-class protein in their

diet. Schistosomiasis is endemic in the area around Foochow, and the institute has shown that it accounts for the cases of splenomegaly there which had been thought to be examples of Banti's disease. Pathological specimens have been examined for hospitals which needed an expert opinion on difficult cases, and material for teaching purposes has been supplied to schools of tropical medicine in England and elsewhere. It seems tragic that such valuable work should receive a check. We are glad of an assurance that the institute has so far escaped damage, and we may hope that Dr. H. G. Earle and his 30 assistants will soon be free to continue their work unmolested.

THE EFFECT OF AN ELISION

THE doctor's honesty and the patient's faith in it, which are one of the themes of Dr. Cronin's recent book, are important factors in the welfare of the community, and it was perhaps natural that the *Daily Express*, which has republished this book in serial form, should comment upon our review of it. In the course of this review we said we had learned from a practitioner who came to London as a stranger that he had received a cheque from the first surgeon he called in after buying his practice. He returned the cheque, the review continues, ascertained from books of reference that the surgeon's credentials were not high, and troubled him no more. "This calm attitude," we remarked, "in the face of an improper proposal, represents that of the average practitioner." In quoting this passage of the review, our contemporary incorrectly attributes the story to Dr. Cronin's hero and omits to mention the salient fact that the calmness was manifested in the return of the cheque and the discard of the surgeon. The elision is more than unfortunate. It is a disservice to the community inasmuch as it suggests to potential patients, on the authority of THE LANCET, that the average practitioner "calmly" accepts illicit fees.

POST-OPERATIVE HICCUP

A DISTRESSING type of hiccup sometimes complicates convalescence from abdominal operations. The hiccup comes on suddenly in a patient whose progress has been smooth, and in the absence of obvious trouble in chest or abdomen. It is most likely to start when some effort is made, such as getting out of bed for the first time; and once started it is quite intractable, persisting day and night, unresponsive to remedies. Gérard De Muylder, in a communication to the Société Belge de Chirurgie, has described two cases which throw light on the ætiology of the condition.[1] In a young girl the hiccup had started when she first got up a week after an operation for chronic appendicitis. It was so bad that she could not sleep, and could eat and speak only with difficulty, and it persisted in severe attacks till the time, two weeks later, when De Muylder first saw her. The least exertion would precipitate an attack. As all efforts to find a cause had failed and the usual remedies had had no effect, the girl had been labelled hysterical and had been sent home with the suggestion that the hiccup would leave off as suddenly as it had started. De Muylder carried out all the usual examinations but got no further till he decided to explore the site of the appendicectomy. He found that the great omentum had been pinched in the wound when the peritoneum was being closed, and was intimately attached to the peritoneal scar. This was no ordinary adhesion, but a definite nipping of the omentum; excision of the scar and of the piece of omentum completely cured the hiccup. When the same type of hiccup occurred in one of his own operation cases De Muylder naturally explored the wound. Each attack was brought on by effort, and the last attack which determined De Muylder to operate occurred just as the patient was about to leave the institution, and this time also he found a tag of omentum firmly attached to the middle of the scar. It had to be divided between two ligatures before it could be freed, but the patient was cured. In this case the hiccup had come on nine days after repair of an umbilical hernia, and once again it was precipitated by the first efforts to get up. In neither case did any sign or symptom call attention to the scar as the cause of the trouble, the wounds being well healed and not tender. In the first case De Muylder was almost driven to performing a phrenectomy to relieve the symptoms, and explored the wound only on chance.

[1] *Scalpel*, July 3rd, 1937, p. 976.

LYMPHO-EPITHELIOMATA

EVEN pathology is not immune from the tendency to make "fashionable" diagnoses. In descriptive oncology, for example, the history of the "endotheliomata" shows what confusion may arise when a new label becomes over-popular. The term endothelioma was introduced by Golgi in 1869 to describe the psammomatous type of meningioma. Soon other atypical tumours were classed as endothelial in origin, including mixed parotid tumours and tumours of lymph nodes, ovary, bone-marrow, bones, and the intestinal tract. In fact, any undifferentiated growth whose primary site was obscure was conveniently regarded as being of endothelial origin and the term fell into disrepute. Of recent years there have been attempts to reclassify these "endotheliomata," and with the aid of accurate histological technique their histogenesis is shown to be varied. Many are in reality metastases from undiscovered primary growths, but in addition certain tumours, such as reticulum cell sarcomata and lympho-epitheliomata, have been recognised and show a characteristic morphology. However, there is still confusion. The first of a series of articles on debatable tumours in human and animal pathology by Harvey, Dawson, and Innes,[1] dealing with the lympho-epitheliomata is thus welcome, and if the other projected articles maintain the standard of this the series will be of fundamental importance in tumour pathology.

In 1911 Trotter[2] described a series of cases of "endotheliomata" of the nasopharynx in which the primary tumour was inconspicuous; but the trauma caused was serious, the patients showing either deafness and bilateral cervical lymph node involvement, or cranial palsies produced by the deep infiltration of the growth into the sphenoid and base of the brain. Subsequent communications from University College Hospital[3 4] on the clinical aspects of these tumours have continued to call them endotheliomata, but contained no detailed account of their histology, though Pilcher[4] has emphasised the extreme radiosensitivity of the type showing early lymph node involvement. In 1921 reports were published from Regaud's clinic,[5] and by Schmincke[6] of tumours termed "lympho-epitheliomata" in the belief that they arose from

[1] Harvey, W. F., Dawson, E. K., and Innes, J. R. M., *Edinb. med. J.* 1937, **44**, 549.
[2] Trotter, W., *Trans. med. Soc. Lond.* 1911, **34**, 372.
[3] Gardham, A. J., *Brit. J. Surg.* 1929, **17**, 242.
[4] Pilcher, R. S., *Proc. R. Soc. Med.* 1932, **25**, 1006.
[5] Reverschon, L. and Coutard, H., *Bull. Soc. Oto-rhin-laryng.* 1921, **34**, 203.
[6] Schmincke, A., *Beitr. path. Anat.* 1921, **68**, 161.

those lymphoid organs of the pharyngeal ring in which there is an intimate relationship between the overlying epithelium and the lymphoid tissue. The primary tumour was small and seldom showed ulceration; cervical lymph nodes were involved early and, as a rule, bilaterally but remained relatively small and did not ulcerate; the tumours were extremely radiosensitive, with complete disappearance of the primary growth and the lymph nodes under radiotherapy, though distant metastases might appear in the lungs, liver, or bones. Histologically the tumour was an anaplastic actively mitosing carcinoma with no tendency to cornification, in which there was little if any demarcation between stroma and tumour; a characteristic feature was the penetration of the tumour masses by lymphocytes, and this was even seen in the visceral metastases. It was not suggested that the lymphoid elements had undergone blastomatous change but that the tumour was a peculiar form of epithelioma with a marked lymphotropism in keeping with the features of the normal lympho-epithelial organs. More recently Ewing [7] and Cappell [8] have described a number of these cases. Harvey, Dawson, and Innes in their summary illustrate the histological features of these tumours by a series of excellent photomicrographs. They stress the importance of a knowledge of the histology of normal and hyperplastic lympho-epithelial tissue, and although admitting the existence of an undifferentiated carcinoma which corresponds with Regaud and Schmincke's description of a lympho-epithelioma, they do not regard the lymphotropism as a specific feature, and would be inclined to group all carcinomata of the nasopharynx and tonsils together. On the other hand, they note that many so-called "lympho-epitheliomata," particularly those occurring in children, are really reticulum cell sarcomata; this is undoubtedly true and unless special attention is paid to cytology their differentiation is very difficult. Although it is agreed that the lympho-epithelioma is only an undifferentiated carcinoma, its clinical characters—small non-ulcerating primary mass, early bilateral lymph node involvement, and extreme radiosensitivity—are distinctive. These characters mark it out from the more differentiated type of epithelioma which shows a liability to ulceration and direct extension to the base of the brain with early cranial nerve involvement. In the lympho-epitheliomata the primary tumour soon disappears under irradiation, and even in untreated cases it may be difficult to find at post-mortem. This has been emphasised by Gräff [9] and a more widespread use of his excellent autopsy technique for displaying the nasopharynx and upper air passages would increase our knowledge of this "debatable tumour."

THE RELIEF OF PARKINSONISM

THE damage to the brain left by an attack of encephalitis is irremediable, but muscular stiffness and slobbering can often be mitigated so as to make life less irksome to the sufferer. The response to extracts of various members of the nightshade family is variable and any of them may fail completely to give relief. The tremor and the oculogyric attacks are more resistant to treatment, and, as Sir Arthur Hall has reiterated,[10] under no circumstances does the Parkinson syndrome completely disappear. Until recently the best results claimed seem to have been by A. Kleeman using doses of atropine up to 20 mg. or more a day, after F. W. Bremer had shown the remarkable tolerance of parkinsonians to this alkaloid. During the last two years another preparation of belladonna has sprung into prominence in Germany and Italy. From an apothecary's shop in a Bulgarian village it has, with the aid of royal bounty, become well known in Rome and other Italian cities. In another column Dr. Fenwick and Dr. Neuwahl summarise the results so far attained on the continent, and give an account of two patients of their own in Rochdale who responded to this Bulgarian treatment when they both failed to get relief from other preparations of nightshade. It is possible, as is claimed, that belladonna grown on Bulgarian soil has some special quality; or that its extraction with the white wine of the country may give a more potent extract. There is however no type of case in which it is more difficult to assess the direct value of therapy than the highly suggestible parkinsonian. The origin in a monastery garden has news value and carries suggestion to the prejudice of scientific assessment. We understand from the two Rochdale doctors that Sir Alfred Law has offered free treatment to necessitous post-encephalitic patients in a nursing-home. Even here it may be difficult to eliminate the factor of mass suggestion; but the need for research, both pharmacological and clinical, is recognised in Rochdale. A skilled assessor would help.

OXYGEN AND FRESH AIR

THE increased interest now shown in oxygen as a therapeutic measure is reflected in a number of studies of the relative value of different ways of giving it. Many of these are unfortunately mere repetitions of previous work which reveal no new facts. L. Dautrebande and his co-workers have recently however [1] brought forward one or two suggestions. They measured the oxygen percentage of the alveolar air in trained subjects who were receiving courses of this gas by various channels, and through nasal catheters of different lengths or through a mask. The best results were obtained by the use of a mask but when a wide reservoir tube was used the alveolar air was not affected by the length of this tube within limits of 30 cm. and 1 metre. The concentration of alveolar air was definitely improved by the addition of a 30 cm. tube to the mask. These results held with a standard flow of 3·2 litres of oxygen per minute, and the mask was still superior at this rate of flow to any of the other methods with flows of 6·3 litres per minute. The result with delivery of oxygen just within the nares by means of a bilateral nasal catheter was surprisingly good, apparently more than doubling the oxygen content of alveolar air, the prolongation of the catheters into the nasopharynx making very little difference. This held with flows of 3·2 litres per minute, and was also more or less true with increases up to 6·3 litres per minute. The increased use of oxygen in this way, however, has an economic side, and in private practice the cost of the oxygen tent, for example, may be very heavy. A return, therefore, to the use of fresh air in the treatment of pneumonia in childhood is, on grounds of economy, one to be recommended, and H. L. Wallace [2] recently described the excellent results obtained in Edinburgh at the Sick Children's Hospital by these means, the method being the simple one of placing the child on the windward side of the ward opposite a widely open window, so that cold air from without plays directly upon the child's face. Prof. R. Degkwitz [3]

[7] Ewing, J., *Amer. J. Path.* 1929, **5**, 99.
[8] Cappell, D. F., *J. Path. Bact.* 1934, **39**, 49.
[9] Gräff, S., *Beitr. path. Anat.* 1934, **94**, 276.
[10] *Brit. med. J.* 1937, **1**, 795.

[1] *Pr. méd.* July 21st, 1937, p. 1097.
[2] *Brit. med. J.* 1937, **1**, 657.
[3] *Münch. med. Wschr.* 1937, **84**, 1043.

supports this type of treatment in a recent account of fresh air as employed at the University Children's Clinic, Hamburg. Broadly speaking, he claims that with strictly comparable treatment in all other respects young children kept freely in the open air during their pneumonia had a mortality-rate only one-third of that when this benefit was not employed. In the Hamburg series a particular point was that the children were carried about by nurses in the fresh air for so many hours a day, a method which is said to combine the value of fresh air, change of position, and a certain amount of "mothering." Enthusiasts, therefore, for oxygen therapy might be reminded of these cheaper measures, and the medical man who likes to combine instruction with pleasure might well read or re-read the description of an adult case of pneumonia treated in the open air with success in "Cupid Goes North" from the pen of a member of the profession under the pseudonym M. Swayne, now unfortunately out of print.

THE ADMINISTRATIVE SIDE OF PSYCHIATRY

THE socialisation of medicine has in most countries gone to its furthest lengths in the fields of public health and mental disorder. The provision of treatment, not only for the certified insane, but also for those neurotic and other psychiatric patients whose disorder is not of a kind that calls for institutional care, has come more and more to be a responsibility of the State, as openly recognised and fully borne as the prevention of epidemics. The extent of this development in the field of psychiatry is not to be judged solely by mental hospitals, though they are still the main medium and concern of public mental hygiene. The administration of a modern mental hospital demands some things that would not have entered the head, much less furthered the success, of an "asylum superintendent" of the past. Many of the essentials for running a mental hospital are, of course, the same now as formerly, but with the development of social psychiatry and of a wider conception of mental disorder, the outlook and the functions of the medical superintendent have been enlarged. With this growth have come complexities which differ from place to place, and certainly from country to country; yet the basic problems are everywhere much the same and the recorded experience of a skilled and distinguished administrator in any country can be a most profitable stimulus to colleagues abroad. Dr. W. A. Bryan, in a book reviewed on another page, shows that mental hospital administration is by no means the soulless stewardship often denounced by enthusiastic workers in other branches of psychiatry. The combination of qualities which it demands is rare. In Dr. Bryan's view the functions of the mental hospital are sound clinical practice, research, teaching, and prevention. It has been possible at the Worcester State Hospital, Massachusetts, of which he is superintendent, to see all these functions working. In research especially, the hospital has, through exceptional circumstances, acquired international renown for the unusually ambitious and thorough plan of investigation into schizophrenia carried out there. It is not to be expected that in teaching and the prevention of mental illness the achievement could be as notable. Many factors conspire to make this, like research, more the work of the university clinic and psychopathic hospital, where a wider range of material offers and a closer contact with the rest of medicine and the public can be maintained. Nevertheless, even in teaching and prevention the mental hospital has much to do. With what most of us would regard as excess of zeal, Dr. Bryan sees the mental hospital of the future as the coördinating agency which will link up "all activities dealing with human beings." Such ambitions overleap themselves. More sober prophets will be satisfied if it becomes, more conspicuously than at present, a progressive, as well as indispensable, part of every organised scheme of public mental hygiene and research.

CIRCULATORY FUNCTION IN LIMBS

THE last few years have seen an intensive study of the obliterative arterial diseases, especially thromboangiitis obliterans. In dealing with these disorders the surgeon is confronted with the difficulty of estimating the circulatory value of the limb—an accurate estimate being important both in choice of treatment and in judging results. The symptoms and the ordinary clinical examination will reveal only the grosser changes, and this is true also of oscillometric methods. Hence a simple mechanical method that would give a numerical result would be extremely valuable. Early last year, in our own columns,[1] Simmons of Manchester described such a method, making use of a simple ergometer, and Ratschow[2] now gives an account of an almost identical apparatus with which he employs similar weights and time-intervals. The findings closely agree, except that the Manchester clinic used the more powerful group of flexors instead of the extensors, and so their numerical results are higher. The flexors appear to be the more suitable muscle-group for testing purposes, for it is nearly always these muscles that are affected in intermittent claudication. Ratschow repeats an observation, often made, that this method is of great value in differential diagnosis from neuritis, rheumatism, and other conditions, and he points out that the work is more easily performed when the limb is dependent. This latter observation supports Telford's teaching that the limbs must not be elevated on pillows, but must be as dependent as possible. Unfortunately the medical text-book and current nursing practice do not as yet, in this respect, differentiate between an arterial and venous thrombosis.

The German school also claims that graduated exercise by means of an ergometer is an important therapeutic agent; but it is doubtful on what grounds this claim is made and it will be interesting later to hear whether it is being maintained.

TEETH IN TRISTAN DA CUNHA

FIVE years ago H.M.S. *Carlisle* paid an official visit to this isolated group of small islands in the southern Atlantic, and the opportunity was taken of making a dental survey of the inhabitants. At that time these were found to show a remarkable absence of caries. When the ship visited the island again in February of this year the survey was repeated, and Surgeon Lieutenant-Commander (D) W. E. A. Sampson, who carried out the work with the help of Mr. J. R. Moore of Capetown (the nearest town), has recently published his results.[3] In the five-year period the population has increased from 162 to 183 and, mainly owing to the efforts of the chaplain, education has been greatly improved, all children under 10 years now attending school. Ten ships have visited the islands in the last 3½ years, a considerable increase over previous years, and these

[1] Simmons, H. T., *Lancet*, 1936, **1**, 73.
[2] Ratschow, M., *Münch. med. Wschr.* July 16th, 1937 p. 1128.
[3] *Brit. dent. J.* July 15th, 1937, p. 86.

have brought a supply of necessities such as sugar and flour, and a certain amount of luxuries including a few boiled sweets and chocolates for distribution on festive occasions. The islanders have also shown more ingenuity in growing fresh vegetables on the island. Breast-feeding is universal until the age of 12–15 months, and, since the arrival of a consignment of tooth-brushes two years ago, tooth-cleaning has been carried out more or less regularly. Unfortunately the improvement in the standard of living (and it may be added, the use of the toothbrush) has been accompanied by an increase in dental caries and gingival infections. Five years ago 83 per cent. of mouths were found to be free from caries and extractions, but this proportion has now fallen to 50. The greater incidence of dental disease has occurred in children and in adults up to 45 years, the older people showing an improvement. Five years ago the 22 children under 5 years had no caries at all; 4 per cent. of the teeth of this age-group are now affected, and at ages between 6 and 13 years there has been a corresponding rise from 0·2 to 1·5 per cent. In 1932 only 3 per cent. of mouths showed gingivitis, and only 1 per cent. pyorrhœa; these figures have risen to 26 and 4 respectively. Even now the islanders' teeth compare favourably with those of Europeans.

EPIDEMICS OF ANTERIOR POLIOMYELITIS

No circumstance in the history of anterior poliomyelitis is so baffling as its change, during the last two decades of the nineteenth century, from a sporadic to an epidemic disease. Epidemics were at first infrequent and relatively small. Not until the startling outbreak in Norway and Sweden which lasted from 1903 to 1906 did public health authorities realise the dramatic proportions which the disease might assume. Now each year seems to provide an epidemic in some part of the world. The increased prevalence and changed incidence of the disease are probably attributable in part to changes in conditions of life. The general adoption of compulsory education led to the herding of both urban and rural children into schools; in the present generation developments of a different kind have caused them to flock together in cinemas and other places of amusement to a degree unknown in the last generation; and cheap transport and the development of the holiday habit have led them to travel about much more freely than did their parents, especially from the country to towns or to crowded seaside resorts. It happens that some of these factors are most active at what is meteorologically the critical time of the year.

In the northern hemisphere the incidence of anterior poliomyelitis normally reaches its peak early in September, and outbreaks of epidemic proportions at this season are to be expected. Europe, which has experienced several during the last ten years, has so far not suffered seriously this year, and in Great Britain the number of cases reported week by week has not been much above the average, though 40 cases are reported this week (see p. 657). In certain parts of Canada and the United States, however, epidemics are causing some alarm. In Canada the serious outbreak seems to be limited to the province of Ontario, where more than 700 cases had been reported up to the end of August. The outbreak is centred in Toronto, where there have been 300 cases with some 30 deaths; 66 cases have been registered at Ottawa. Across the border in the United States the maximum incidence seems to have been in Chicago, where over 100 cases were reported during August, and in Buffalo (New York State). In the States as a whole there have been over 4000 cases this summer, in comparison with about 1600 during the corresponding period last year. In the southern hemisphere, as in the northern, the incidence of poliomyelitis ordinarily reaches its maximum in the early autumn, that is to say in the months of February and March, though it persists in some degree throughout the winter in all countries. A disturbing feature is the report of an outbreak at Melbourne in what is there the winter season, a time when epidemics have hitherto been unknown. Epidemics in the cold weather season have certainly occurred elsewhere—one in this country six years ago in November—but always in the early part of the winter, following an abnormally high local incidence throughout the autumn. It is to be hoped that this winter outbreak will remain an isolated phenomenon.

It is now accepted that the disease is spread by abortive cases and healthy carriers, the infection being harboured in the nasopharynx and transmitted by droplets. The only general measures available for limiting an epidemic are those applicable to droplet infections in general. Within affected areas children and young adults should be prevented as far as possible from congregating, any child or young adult that leaves the area should be in quarantine for at least a fortnight and, what is equally important, children or young adults should be discouraged from entering the infected area, since epidemics tend to be revived by the influx of new susceptibles. Measures of this kind have been taken in Ontario, in various towns of the United States and in Melbourne. Where children or young adults sleep in dormitories and camps the beds should be adequately spaced. It has been shown for other droplet infections that dormitories in which the beds are close together provide a favourable locus for transmission, and that the critical distance between the beds required to counteract this danger is about four feet. The suggestion that in holiday camps and other sleeping quarters where wide spacing is impossible, sleepers should lie "head to foot" to avoid breathing too near each other's faces is one that we should like to see tested by bacteriological methods before whole-heartedly supporting its adoption.

Various protective measures applicable to the individual have been tried but not on any large scale. Local ones range from the washing of the nasopharynx night and morning to the application by means of a spray attached to a special long nozzle, of a solution of zinc sulphate to the olfactory region—a procedure that has given promising experimental results.[1] The use of nasal clips or small muslin masks by children during an epidemic does not seem to us practicable. Methods of inducing active immunity by means of vaccines are at present under a cloud, but there is less danger in attempts at producing temporary passive immunity by the injection of immune serum. Recent experience in America, recorded in the course of a discussion at the July meeting of the American Medical Association[2] is on the whole unfavourable to this method, but in their review of Danish observations G. Hardy Eagles and his co-workers[3] were unable to rule out its possible value. The collection, preparation, and prophylactic use of the serum requires a great deal of organisation, and though it is not beyond the powers of the health departments of the larger cities more evidence of its efficacy would

[1] See *Lancet*, July 24th, 1937, p. 203.
[2] *J. Amer. med. Ass.* August 7th, 1937, p. 404.
[3] Eagles, G. H., Jensen, C., and Henningsen, E. J. *Lancet*, 1937, 1, 462.

be required before they could properly be urged to undertake the task. We understand that the stock at one time available for distribution from the Western Hospital (L.C.C.) Fulham is now exhausted.

DR. GEORGE SIMMONS

THE death in Chicago of Dr. George Henry Simmons at the age of 85 severs a link between this country and medical journalism in America, for Simmons was born at Moreton-in-the-Marsh, Glos, and crossed to America as a lad of 18 to become for twenty-five years the guiding spirit of the American Medical Association. In fact on his retirement Harvey Cushing referred to him as an example of what America can do for an Englishman if it catches him young enough. Simmons certainly had a brilliant career as a medical student at Nebraska University, albeit he was eking out a livelihood by journalistic work. After qualification he revisited Europe, obtained the licence in midwifery at the Dublin Rotunda and visited other centres abroad. During the next fifteen years of private practice he founded the *Western Medical Review*, and it was not until he was 47 years old that he became secretary of the American Medical Association and editor of its journal. Neither was then flourishing, but Simmons's success was immediate and in a period of 25 years the circulation of the journal rose from 8000 to 90,000, and the daughter monthly *Hygeia* had been founded to counteract the influence of the pseudomedical columns in lay journals. It is now many years since Simmons's retirement, but he may still be gratefully remembered for his contribution to the educational progress of the American medical profession during the first quarter of the century.

OPIUM AND CODEINE

AT a recent meeting of the Permanent Central Opium Board at Geneva, with Mr. Lyall (British) in the chair, the statistics concerning the imports and exports of codeine and dionin were scrutinised. These statistics, unlike those for all other scheduled drugs, are received only once a year instead of quarterly. There is evidence of the growth of the medical use of codeine as a substitute for morphine, and the Health Committee of the League of Nations is engaged in an investigation as to the extent to which codeine can give rise to addiction. In Canada, since May 1st of this year, codeine had been brought under the import certificate system with good effect. Nevertheless a demand had sprung up for capsules containing aspirin, phenacetin, and caffeine with half a grain of codeine. Addicts, it is reported, purchase these capsules in quantities and extract codeine from them. It may be recalled that in the first draft of the Opium Convention of 1912 codeine was included as a drug of addiction, but, in consequence of objection raised by the German delegates, it was struck out. In Switzerland and in Poland it is understood that codeine is placed under control similar to that of the other alkaloids.

During the examination by the Opium Board of the progress report prepared by its secretary dealing with the statistical returns furnished by the several governments, the Japanese representative pointed out that one-fifth of the states were not carrying out their obligations in regard to the returns. In view of the disclosures made to the Advisory Committee of the League of the alarming state of affairs in the Far East as regards clandestine manufacture and illicit traffic it is good to know that Japan has due regard to the fulfilment of responsibilities.

The Opium Central Board appears to be in some doubt as to which body is responsible for keeping the contracting parties up to the undertakings to which they are pledged. The Opium Advisory Committee, under the Convention of 1915, the Permanent Central Opium Board, under the Convention of 1912, and the Supervisory Body under the Limitation Convention of 1931 would all appear to be concerned, and either severally or collectively should apply the necessary corrective to States which default in their international obligations.

"THE PRACTITIONER" IN BENTINCK-STREET

IN its seventieth year a medical journal should have sown its wild oats and be thinking about a permanent home. It is no surprise therefore to find the *Practitioner* settling down at the centre of medical London. Nevertheless there is plenty of room for astonishment (as well as for other purposes) at No. 5, Bentinck-street, W.1. Believing that function should govern structure the directors have built an entirely new house for the journal and they present the profession and the public with a building that is architecturally memorable as well as charming. An extra number of the *Practitioner* describes and illustrates it, and readers who care for such things—as everyone should—will find themselves eager to see the place for themselves. The outside has, as is proper, a strongly Georgian flavour, but is modern enough in detail to justify its association with the interior. Once through the doorway, the architect, Mr. Howard Robertson, has been able to let himself go—if such an expression is permissible when the going is so dignified. His most daring innovation is the large round lift shaft, "a circular fluted tower," running through the offices to the flats above, and this central structure gives character without awkwardness. For the better exclusion of noise and dust the offices are air-conditioned in such a way that the air of every room is completely changed every 10–15 minutes. The lighting is indirect and the furniture and decorations, for which Mrs. Howard Robertson is largely responsible, are both fine and exciting. Even the carpets have been specially made, and to complete the "period" effect of the new building there are carefully chosen glass, china, and cutlery. "Now at last," writes the chairman, "we have an office which is the outward sign of what we stand for." The success of the *Practitioner* under the editorship of Sir Humphry Rolleston and Dr. Alan Moncrieff is common knowledge, and we hope the new surroundings will facilitate the continuance of their valuable work.

IT is announced that Major-General W. P. MacArthur, commandant of the Royal Army Medical College, has been selected to succeed Lieut.-General Sir James Hartigan as director-general of medical services at the War Office when Sir James completes his term of office next March.

The ninth International Congress for Psychotherapy will be held at Copenhagen from Oct. 2nd to 4th. Prof. C. G. Jung (Zurich) and Dr. Poul Bjerre will give the inaugural addresses. The two main subjects for discussion are Psychotherapy in General Practice and Can Psychotherapy be Taught? Dr. Oluf Brüel, 2, Amagertorf, Copenhagen K, is acting as secretary to the congress.

NATIONAL HOSPITAL, QUEEN-SQUARE, LONDON.—Lord Nuffield, who a little while ago gave £5000 to this hospital to build a new research department, has now given a further £24,000 for the same purpose.

SPECIAL ARTICLES

TWO SCOTTISH HEALTH REPORTS

ADVANCING AGE OF POPULATION

THE Department of Health for Scotland has issued two documents that should provide useful ammunition for the health campaign to be begun by the Government in the autumn. One is a summary of the excellent report of the committee on Scottish Health Services that appeared in June, 1936, and was reviewed in THE LANCET at the time (1936, **2**, 36). The full report, though by no means a bulky volume, may need more time for its assimilation than many busy people are able to spare, and this short summary, which is of special importance to medical practitioners, should be welcomed by all who are interested in health progress.

The summary begins by pointing out that the saving of lives has assumed a new significance from the decline in the birth-rate, which now threatens Scotland with a declining population. The average age has risen from 26·4 years in 1871 to 31·3 years in 1931; and in certain areas the decline in population has for some time been in process and is raising acutely the question whether such areas are able to provide through present administrative units and financial resources the services required by modern standards. Though the death-rate has gone down, and the mean expectation of life at birth has risen from 40·3 years in 1861–70 to 56 years in 1930–32, there is still a wide prevalence of preventable disease. Examination of school-children in a large urban area showed that about 16 per cent. suffered from ailments that could not be classified as minor; every year over 20 per cent. of the insured population are rendered incapable of work by sickness; and of the men medically examined for enlistment in the army 38 per cent. are rejected on medical grounds. The vital statistics of Scotland, it is stated, "are disquietingly less favourable than those of England and Wales and several other European countries." Though the annual cost of the health measures now in operation in Scotland is nearly £20,000,000, it does not represent the whole burden that ill health imposes upon the country.

The report reviews the existing health services and finds them inadequate; they are far from covering the whole ground that needs to be covered and lack unity of methods and direction. Cogent reasons are given for the recommendation that the various services, suitably extended, should be integrated into "a national health policy whose primary aim should be the promotion of health rather than the cure of disease." It is significant to note that in the new system of health services so recommended for adoption a prominent place is assigned to the general medical practitioner, the importance of whose functions, actual and potential, in the service of the community is now becoming more adequately realised. The recommendations are in line with recent developments of health activities: the national physical training and recreation campaign, the health education campaign that is now in preparation, the new maternity service, and the projected Bill for providing medical benefit under the health insurance scheme for young persons between leaving school and attaining the age of 16.

SICKNESS AMONG THE INSURED

The summary of the health services report may usefully be studied together with the latest annual report, the sixth of the series, on incapacitating sickness in Scotland. This report, which covers the year ending June 30th, 1936, affords evidence of a serious increase of certified incapacity for work among insured persons. Though the number of cases of incapacity per 1000 insured persons, 219 in 1935–36, was less than the number, 231, in the previous year, it was higher than the quinquennial average, which was 214. The drop in 1935–36 from the previous year was due to the low prevalence of influenza in 1935–36, when the number of cases ascribed to this cause was the lowest since the present system of recording began in 1930. The number of days of incapacity per insured person rose by 5 per cent., or half a day per person per annum, over the previous year, and was no less than 11½ days, the highest number yet recorded. The total number of working days lost through sickness was 19¾ million, an increase of nearly 2¼ million, or 14·7 per cent., over the average for the previous five years. This is the more remarkable since there was no special prevalence of disease during the year, the incidence of influenza being, as already stated, unusually low. The increase was of course due to the greater average duration of the period of incapacity, which in 1935–36 was 52·21 days as against the quinquennial average of 46·66 days. The increased duration is attributed not to deterioration of recuperative capacity but to the increasing frequency of chronic illness. The average age of the population is rising, and the time lost through sickness increases with advancing age. This is true of both males and females, but at all age-periods sickness loss is greater among women than men, the difference being most obvious at ages 20–30 and at ages over 60. It is interesting to note that respiratory diseases form the chief cause of incapacity, the next being chronic rheumatic conditions.

SHOULD THE PANEL DOCTOR CERTIFY INCAPACITY?

The advancing age of the population explains only part of the persistent growth of certified incapacity, which constitutes a problem of national importance. In spite of all said and done about it we still seem a long way from a solution. There are those who attribute it mainly, if not entirely, to the careless issue of incapacity certificates, and who doubt whether certification can fairly be considered a proper function of the doctor attending a patient. A writer in the *National Insurance Gazette* has recently suggested that insurance practitioners should be relieved of the duty of certifying incapacity for work. Their proper function, it is held, is the provision of medical care for the persons for whom they have assumed responsibility and does not include certification. This view has often been expressed in Germany, whereby some societies benefit is not paid, except for bed-ridden patients, without a certificate from a medical referee. On medical grounds the proposal is obviously open to objection. Who can be in a better position to form an opinion on a patient's capacity for work than the doctor in attendance, who has in many cases treated the patient in previous illnesses and knows his reactions to various kinds of strains? In practice, however, the question is not so simple, and it calls for a more searching inquiry than anything that has hitherto been attempted.

PARIS

(FROM OUR OWN CORRESPONDENT)

TUBERCULOUS MENINGITIS

WHAT will assuredly prove a standard work on tuberculous meningitis has lately been completed at the Clinique Médicale des Enfants de Paris, to which Prof. Nobécourt is attached. In coöperation with Dr. Sotirios B. Briskas, he has investigated the behaviour of tuberculous meningitis in this hospital during the 15-year period 1921–35 and he records the results in the *Presse médicale* for August 4th. During this period 13,331 children under the age of fifteen were admitted to the general wards of the hospital, and the 344 who developed tuberculous meningitis—diagnosed as such by lumbar puncture and post-mortem examination—represented 2·5 per cent. of the total. The incidence differed considerably at different ages: in the first three months of life there was not a single case, and during the rest of the first year of life the morbidity was not particularly high; it rose abruptly after the first year, its maximum being reached between the ages of two and five; from the fifth year onwards there was a fairly steady decline. The two sexes were about equally affected, but in the second year of life the morbidity for girls was twice that for boys. As for the seasonal incidence, it was greatest in March and least in October; and the period from April to September showed a higher rate than that from October to March. Between 1921 and 1935 there was a decline in the frequency of tuberculous meningitis, presumably because opportunities for infection became, on the whole, fewer. The certain or probable source of infection was discovered in 38 per cent. of all the cases and in 51 per cent. of those in which the child was less than eighteen months old.

CREMATION IN FRANCE

Prof. Barrier, a former president of the Academy of Medicine, presided over this year's meeting of the Société pour la Propagation de l'Incinération. The data presented show how small is the place so far taken by cremation in France. During 1936 the Paris crematorium dealt with only 940 bodies. Strasbourg came next with 200, Marseilles with 61, Lyons with 33, Rouen with 12, and Rheims with only 1. Up to the end of 1936 all these French crematoria had effected a total of 27,898 cremations since they were started—a total that is relatively so small as to be almost negligible.

UNITED STATES OF AMERICA

(FROM AN OCCASIONAL CORRESPONDENT)

ACCIDENTAL DEATHS

ACCORDING to a release from the National Safety Council, and an article in the June number of *Public Safety*, the number of accidental deaths in 1936 was 111,000. The accident-rate per 100,000 jumped to 86·4, which was 10 per cent. higher than in 1935. Approximately half the increase, it was said, was due to excessive heat. All types of general fatalities increased. Traffic deaths reached a new high total of 37,800, but the rate of increase was not as high as that due to domestic carelessness from which cause there were 38,500 deaths—an increase of 20 per cent. The motor accidents increased by 4 per cent. over 1935. Accidental deaths classifiable from an occupational cause reached 18,000 as compared with 16,500 in 1935. Deaths due to such agencies as drownings, poisonings, and firearms, jumped 11 per cent. to 20,000 in 1936. The only encouraging feature to be gained from the deaths from traffic accidents was that this increase was only 4 per cent., as compared with an increase of nearly 11 per cent. in gasoline consumption, which meant 22 billion more miles of travel on streets and highways.

The reports state that there were 10,730,000 injured, with 400,000 suffering permanent disability. The monetary costs have been estimated at $3,700,000,000: $2,000,000,000 in loss of wages, $400,000,000 in medical expense, $200,000,000 in insurance (not including the amount of claims paid), $820,000,000 motor vehicle property damage and £293,000,000 for fire losses. There are in addition many losses which are more intangible.

An interesting feature of the report was that the returns showed that accidents killed 110·2 men in every 100,000, while the fatalities among women for similar causes were only 46·1 in every 100,000. Among men, accidents killed a greater number than any disease except heart ailments. Among women, six diseases—heart disease, cancer, cerebral hæmorrhage, chronic nephritis, pneumonia, and tuberculosis—in that order—killed a larger number than did accidents. All of the national increase in traffic deaths occurred in rural districts (including the "under 10,000" cities). One-third of the traffic moves at night, but two-thirds of the accidents occurred during this period.

During 1936, the reported percentage in 26 States of the "had been drinking" participants in fatal accidents averaged 7 per cent. for drivers and 11 per cent. for pedestrians. Three States classify alcohol as a "cause" of motor vehicle accidents. Illinois reported 8 per cent. of fatal accidents to alcoholic drivers and 6 per cent. to alcoholic pedestrians. New Hampshire reported 10 per cent. for drivers and 6 per cent. for pedestrians. Arkansas reported the number due to alcoholic drivers at 23 per cent. in 1936.

With much increased travelling in 1936, the railroads were able to avoid any increase in passenger fatalities; there were 23 in both 1935 and 1936. There were increases in grade-crossing fatalities, however, and among employees.

HUMAN STERILISATION IN THE UNITED STATES

According to reports of the Human Betterment Foundation, the total number of official sterilisations in the United States up to Jan. 1st, 1937, was 25,403, including 10,674 males and 14,729 females. California, which has been the leading State in number of sterilisations, has thus treated 11,484 insane and feeble-minded patients in the last twenty-eight years. The total sterilisations represents an increase of 2241 over that announced the previous year. The figures, however, do not include operations in States that do not have sterilisation laws. Twenty-nine States now have sterilisation laws, the most recently enacted being that of Georgia, in 1937. A book embodying a case study of the first 10,000 of the California sterilisations will be published this year and entitled "Twenty-eight Years of Sterilization in California."

DEATHS

Dr. JOSEPH L. MILLER died suddenly on August 6th. He was a member of a great many medical societies, including the Association of American Physicians,

and the American committee of the International League Against Rheumatism. He served as editor of the *Archives of Internal Medicine* from 1909 until 1931, and was himself a prolific contributor to scientific and medical subjects.

The death of VERNON LYMAN KELLOGG occurred on August 8th. For many years he was secretary of the National Research Council and as such occupied an active and influential position in American science. During and after the World War he was active in relief work in Belgium, Poland, and Russia. By profession he was an entomologist and he was the author of numerous books on zoology and entomology.

The death of JAMES RAMSAY HUNT brings to an end a distinguished career in clinical neurology. He was director of the neuropsychiatric division of the New York Neurological Institute, professor of neurology at Columbia College of Physicians and Surgeons, and consultant to numerous other institutions. He was the author of many papers on basic and clinical neurology and was a corresponding member of the Société de Neurologie de Paris.

GRAINS AND SCRUPLES

Under this heading appear week by week the unfettered thoughts of doctors in various occupations. Each contributor is responsible for the section for a month; his name can be seen later in the half-yearly index.

FROM A LONDON PHYSICIAN

II

THE sufferings of one nation are appreciated by others, not only on the moral but also on the medical plane. The war in China has made ephedrine, a product of the Ma Huang plant, scarce. Thus are British asthmatics penalised by Japanese policy.

* * *

Ephedrine calls to mind pharmacology, a heterogeneous subject disliked by most students, fascinating to a few. The teaching of this subject will be modified in the near future when, we are given to understand, the medical curriculum will be made perfect. Increased stress will be laid on applied pharmacology, which will be taught in the clinical years; while the principles of drug action will presumably be inculcated by preclinical teachers, probably by those wizards the physiologists. Many of the communications to the Physiological Society have in recent years had a distinct pharmacological flavour. Indeed, one or two substances, formerly regarded merely as highly potent drugs, are now claimed as agents of normal function. The old difficulty of definition of the term drug has increased. Is acetylcholine a drug or tissue autacoid or both? A detractor of a famous pharmacologist has said unjustly that the great man regarded as a drug anything which would, when injected into a cat, produce a paper. Fortunately, common sense enables us to draw a rough borderline and to realise that a substance may seem a drug to one man and a hormone to another.

* * *

The exponent of drug action is sometimes regarded with suspicion or even with contempt by some of his colleagues. Dislike and disparagement may be instructive. Thus I have heard a morbid anatomist say that pharmacological data are valueless, because (he said) they accrue from the action of drugs, often of obscure composition, on moribund tissues. I wondered at the time if a tissue could only tell the truth after death, and especially when immortally embalmed in a bottle or when sleeping as a wafer in a paradise of Canada balsam. Truth, whatever it may be, is ample enough to embrace both histology and pharmacology. Admittedly there has been a tendency on the part of the laboratory worker to neglect clinical observations on drug action, but the bias is being corrected. The discovery of ergometrine has shown the value of coördination between clinician and experimentalist.

Some pithy summaries of the effects of drugs are given by Shakespeare. The actions of alcohol as tissue poison, anæsthetic, diuretic, and aphrodisiac are lucidly portrayed in *Macbeth*. In this play also, the ingredients of the witches' cauldron are prophetic of the practice of the blunderbuss organotherapy in which the credulous indulged within living memory.

The Greek word for drug meant also a charm or philtre. It has associations with magic the thought of which excites curiosity. Magic may be white or black, good or evil. F. Bartlett, in a recent review in *Nature* of E. E. Evans-Pritchard's "Witchcraft, Oracle and Magic among the Azande," produces some interesting quotations and comments. Magic is a "natural philosophy by which the relations between men and unfortunate events are readily explained," and furnishes these natives (the Azande) with a "ready and stereotyped means of reacting to such events." Are we not as doctors grateful for our patients' stereotyped verbal reaction to their symptoms? The rhetorical question "Is it rheumatism?" often saves us a deal of trouble, even if we prefer the term fibrositis. We must be careful lest, imbued with the philosophy of magic, we accept too readily our patient's rationalisations and miss a case of tabes dorsalis or other serious disease. The Azande are, it seems, capable of treating a festering wound as if caused by witchcraft and by a spear and see no contradiction when both methods of treatment are applied to the one wound. We also treat organic disease by reputedly rational methods and by placebos. The rational remedy is for the patient's wound, the placebo is magic for his troubled spirit.

* * *

The British Association for the Advancement of Science is now in its one hundred and sixth year. At its meeting at Nottingham Sir Edward Poulton has spoken on Darwinism and, I believe, he brought dice into his address as well. Mr. H. G. Wells has dealt severely with the school-teachers, and Dr. William Brown is reported to have descanted on the psychotherapeutic powers of dictators. I recall vividly the large part which the teaching of evolution took in the lectures on zoology to which I once listened entranced. The proof of evolution, the geological record, the wars of Huxley against the bishops, his epic cry that the Lord had delivered one of them into his (Huxley's) hands, and a host of other stirring facts and fancies exalted the youthful and impressionable mind. But the first fine careless rapture wears off and one begins to wonder what evolution is all about and whither it is leading. After reading the "Origin of Species" and Huxley's "Essays," I

came across a book of which the thesis was that each step forward in evolution is accompanied by a step backwards: this theory seemed at any rate to be applicable to the world of ethical values and also of education. The years which followed the study of zoology were employed in dissecting the highest product of evolution and in examining its physiology as illustrated by experiments on the cat and frog. Strata were piled on strata and the Pleistocene and recent formations of clinical teaching deeply buried the earlier layers. The breezy surgeons and cautious physicians have overlaid the early lessons in science with a mixed crust.

The lungs, formerly regarded simply as an apparatus for gaseous exchange, ventilated by the untiring rhythm of respiration and derived by evolution from the swim-bladder of the fish, became organs which emitted strange crackles and wheezes. The stomach, embryologically an enlargement of the foregut, became a vessel of dyspeptic misery. In clinical lectures grave references to the relation of indigestion to constipation as being one of cause and effect rather than effect and cause gave one a new line on the alimentary canal. Ulcers, growths and fevers, the labyrinth of neurology, Cheyne-Stokes respiration as a phenomenon to be observed as a dire omen and not as a subject for physiological speculation: these and a host of other things have tended to mellow and perhaps to debase one's outlook. No doubt the new curriculum will make possible a new generation of doctors endowed with the perfect proportions of science and art.

PANEL AND CONTRACT PRACTICE

A Refusal to Reinstate

REMOVAL from the medical list has sometimes stimulated the ingenuity of a practitioner who is reluctant to abandon his panel work. Dr. A, removed in 1935 from the medical list of the London insurance committee, deserves full marks for his pertinacity. The ground of removal was fee charging in respect of an insured person about 80 years of age. The medical service subcommittee was invited to consider three earlier cases occurring over a period of ten years; in all three there was a question of financial advantage and in all three Dr. A was found to be at fault. He lately applied for reinstatement in the medical list of the Kent committee. The practice concerned was mainly in Kent, but several patients lived in London; the Minister therefore caused inquiries to be made not only of the Kent but also of the London insurance and panel committee.

Dr. A, it seems, after his removal from the London list in 1935, continued to be associated with the practice. He entered into partnership with another doctor who secured many of the patients previously attached to the insurance side of the practice. Dr. A continued to live on the premises and, according to reports received by the medical benefit subcommittee, it was difficult—if not indeed impossible—to restrain him from intervening in the insurance practice carried on from that address. The partner found the arrangement unsatisfactory and felt obliged to relinquish the practice. Another practitioner, however, took his place and the insured persons were transferred to the new-comer. On investigating the terms of this partnership, the committee appears to have found grounds for concluding that the practice remained the property of Dr. A, his partner being substantially a salaried assistant who was introduced for the sole purpose of treating the insured persons attached to the practice and who was not allowed any control of the affairs of the practice. So strong was this impression that the subcommittee decided to recommend the committee to make a representation to the Minister of Health that the continuance of the new partner on the medical list would be prejudicial to the medical service of the insured inasmuch as he could not be absolved from complicity in an arrangement under which in effect he acted as "cover" for Dr. A. Before the matter came before the full committee, Dr. A severed his connexion with the practice and entered into an agreement restraining him from practice at the address concerned or at any place within one and a half miles therefrom for a period of ten years.

A few months later a practice mainly in the Kent insurance committee's area was transferred to Dr. X who was understood to be the prospective owner. In June, 1937, Dr. X produced to the insurance committee a deed of partnership which showed that the new practice was really the property of Dr. A, and that Dr. X the nominal insurance practitioner, though described as a partner and entitled to receive a fourth share of the partnership profits, was actually living in the house occupied by Dr. A. Dr. X said that his relations with Dr. A had become strained and that he was proposing to leave the practice on June 30th. He would not be in a position, he said, to nominate his successor because Dr. A had not indicated whether he had yet found another partner who would be responsible for the insurance practice. Subsequently Dr. X asked that his resignation might be post-dated to August 11th. The postponement was regarded as significant for the purposes of the investigation inasmuch as it was on June 22nd that the London committee learned that the Minister had invited the observations of the Kent committee upon Dr. A's application for reinstatement. When the Ministry was informed that the practice included patients in the London area, a similar invitation was sent (as already stated) to the London insurance and panel committee. The report of the subcommittee states that, in spite of the Minister's declaration in 1935 that Dr. A's continuance on the medical list would be prejudicial to the efficiency of the medical service of the insured, Dr. A had, for a considerable part of the intervening period, been the owner at first of his former practice and later, after he had left that address, of another insurance practice. He had been in full control of these two practices except that, owing to his own disability on removal from the medical list, the work had to be done by another practitioner who was more a salaried assistant than a partner. The subcommittee's report sums up the position by suggesting that the abuses of the system of "farming out" in panel practice are bad enough but that the objections to that system must be all the stronger when the financial advantages accrue to a practitioner who is himself disqualified from insurance service. "Such a state of affairs would render Section 36 of the National Health Insurance Act nugatory and would, we think, bring the administration of medical benefit into contempt.

In the circumstances it is hardly surprising that the committee expressed itself as remaining strongly of opinion that the inclusion of Dr. A in the medical list would be prejudicial to the medical service of the

insured, and the Minister has now refused his application for reinstatement.

Refresher Courses

The Minister of Health is now prepared to approve grants to enable insurance practitioners to attend, under certain circumstances, short courses of post-graduate study. Normally the course will consist of intensive study in general clinical subjects and will occupy two weeks full time. These courses will now be available to practitioners other than those practising in rural districts and will not be subject to any inquiry as to the practitioner's income. Grants will be payable in respect of courses approved by the Minister after consultation with an advisory committee representative of the Insurance Acts Committee. The conditions under which a practitioner becomes eligible for the grant have already been set out in this column (p. 472). A grant will cover the following items:

(1) A fee for the course not exceeding five guineas (unless a higher fee is specially sanctioned by the Minister) as fixed by the medical authorities. This fee will normally be payable directly by the Minister to the medical authority providing the course.

(2) Third-class railway fare or its equivalent.

(3) Subsistence expenses incurred, not exceeding five pounds per week, where attendance at the course necessitates the practitioner sleeping away from his residence, and not exceeding one pound a week in other cases.

(4) A sum not exceeding eight guineas a week inclusive in respect of the engagement, where necessary, of a whole-time locum tenent.

The insurance practitioner desiring to avail himself of these facilities should apply to the secretary of his panel committee, and when his application has been approved he will receive from the Ministry of Health a voucher for production to the authority providing the post-graduate course. In the immediate future courses each lasting a fortnight will be held at the British Postgraduate Medical School, Hammersmith, beginning on Sept. 20th, Oct. 18th, and Nov. 15th. There will be 13 vacancies in the first course, 20 in the second, and 25 in the third. Details of other courses will be issued later in the year.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Capt. F. C. Wright to *St. Angelo* for *Maine*.

Surg. Comdrs. J. Wyle to *President* for Medical Depôt, Deptford; C. E. Greeson to *Royal Oak*; and T. J. O'Riordan to *Cumberland*.

Surg. Lt.-Comdrs. D. F. Walsh to *St. Angelo* for R.N. Hospital, Malta; A. L. Moorby to *Drake* for R.N. Hospital, Plymouth.

Surg. Lt.-Comdr. V. J. Fielding placed on Retd. List at own request.

Surg. Lts. G. C. Denny to *Pembroke* for R.N.B.; T. A. M. Maunsell to *Ramillies;* and R. M. Kirkwood to *Rodney*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Lt. J. L. Dunlop to R.N. Hospital, Haslar.

Surg. Lt. (D) J. W. W. James to *Victory* for R.N.B.

Proby. Surg. Lt. G. A. Hart to be Surg. Lt.

ARMY MEDICAL SERVICES

Maj.-Gen. W. P. MacArthur, D.S.O., O.B.E., K.H.P., has been selected to succeed Lt.-Gen. Sir James A. Hartigan, K.C.B., C.M.G., D.S.O., K.H.P., as Director-General of Army Medical Services, when the latter completes his tenure of office on March 1st, 1938.

Col. A. N. Fraser, D.S.O., late R.A.M.C., retires on ret. pay.

Lt.-Col. P. S. Tomlinson, D.S.O., from R.A.M.C., to be Col.

ROYAL ARMY MEDICAL CORPS

Lt.-Col. R. C. Paris, having attained the age for retirement, is placed on ret. pay.

Maj. and Bt. Lt.-Col. E. B. Marsh, M.C., to be Lt.-Col.

Maj. C. Armstrong, M.B.E., to be Lt.-Col.

Maj. S. Fenwick, M.C., h.p., late R.A.M.C., retires on ret. pay.

Temp. Commissions.—Capts. to be Majs.: J. D. Dillon and R. S. de C. Bennett.

ARMY DENTAL CORPS

Col. D. Clewer to be Dir., Army Dental Serv., War Office.

Maj. T. K. Place to be Lt.-Col.

Short Service Commissions.—Lts. to be Capts.: W. K. Eyles, S. G. Gourley, J. A. M. Gemmell, and J. E. Maywhort. Lts. (on prob.) confirmed in their rank: C. H. James, W. H. Burndred, S. A. Nicholson, and S. J. Gittings.

ROYAL AIR FORCE

Flight Lts. D. W. I. Thomas to No. 8 Armament Training Camp, Evanton; and R. A. Cumming to R.A.F. General Hospital, Iraq, Hinaidi.

INDIAN MEDICAL SERVICE

Lt.-Col. A. C. Munro to be Col.

Lt.-Col. D. L. Graham, O.B.E., retires.

A.D.M.S.—Col. A. A. McNeight, *V.H.S.*, I.M.S., has vacated his appt. and Col. A. C. Munro, I.M.S., has been appointed.

Indian Medical Department.—Maj. (Sen. Asst. Surg.) A. N. de Gruyther, M.B.E., retires.

DEATHS IN THE SERVICES

Major Archibald Donald Mackinnon, C.M.G., who died at Hove on Sept. 5th, in his 73rd year, was the son of Donald Mackinnon, D.D., Minister of Strath, Skye. He was educated at Aberdeen, qualifying in 1887 and taking the M.D. in 1892. He was medical officer for Uganda Protectorate 1894–97 and later to the Sultan of Zanzibar (who awarded him many honours) and the Imperial British East Africa Company. In the European war he was employed on special duty in 1917 with the rank of major. He was created C.M.G. in 1900, and O.B.E. (Mil.) in 1919. His home was at Kyleakin, Skye, and he was a county magistrate for Inverness.

THE LANCET 100 YEARS AGO

September 9th, 1837, p. 873.

From a leading article on "Verba Consilii, or Hints to Parents who intend to bring up their Sons to the Medical Profession," by W. H. Denham, F.R.C.S.

The approaching month of October—celebrated in the calendar of British Medicine—brings with it the occasion for many anxious thoughts in the bosoms of hundreds of parents, in the life of whose sons a new era is about to commence. . . . On the motives which should guide a parent in assigning a son to pursue the study of medicine, Mr. Denham offers the following excellent remarks:—

"But before parents come to a determination to enlist a son in the ranks of the medical profession, it is of the utmost importance that they should satisfy their minds that the mental capacity of the boy is so constituted for imbibing draughts at the fountain of knowledge, as will fit him to undertake the important task that he will be called on to perform. Unless they are satisfied on this point, the sooner they relinquish the idea of making him a surgeon the better; for, without such capacity, the exertions of teachers, and their own trouble and anxiety, as well as their money, will be sadly misapplied. There is another preliminary circumstance which parents should also well consider; their son ought to be of that hardy frame of body, that he will, as far as probability goes, be able to bear the excessive fatigue and watching which, to a certain extent, fall to the lot of every medical man, of every country practitioner in particular. If he be not, however intelligent he may be, I would earnestly advise them not to make him a surgeon; for, unless the *mens sana* have its domicile *in corpore sano*,—unless he be healthy and hardy, wofully severe will oftentimes be his labour—frequently more than he will be able to perform, without risking the destruction of his health . . ."

CORRESPONDENCE

HEALTH OF MEDICAL STUDENTS

To the Editor of THE LANCET

SIR,—The eminently wise and timely leading article in your issue of August 28th invites certain comments which I hope you will allow me to make.

(1) You rightly draw attention to the circumstance that the curriculum as at present imposed exacts practically double the duration of study of that which obtains in most other professions. Let me cite a concrete case :—

A colleague of mine in the House of Commons entered the House as secretary of a great trades union. After some years of membership he decided to qualify as a barrister, while retaining his membership of the House. He was called to the Bar within two years of commencing his legal studies, and immediately secured briefs from the trades unions and other sources, in such measure that he contemplates making law, and not politics, his career.

Such a metamorphosis would be impossible in medicine. The medical student spends from three to four years (taking into account the new requirements for registration) in the study of the sciences which are necessary to the understanding of medicine. This, as you say, is "in effect, graduation in science." I have endeavoured, without success so far, to secure for the London University student of medicine the right to rank the second M.B. examination as qualifying for a degree in science, to which, at London University, it is equivalent in range and standard. With the exception of a few universities—e.g., Oxford, Cambridge, Dublin, and Manchester—no facilities are provided by which the medical student who has had scientific training which ought to qualify him for a degree in science can in fact achieve that degree, and this is a grievance which should be remedied.

(2) But the most important and valuable contribution which your leader makes, is to call attention to the strain on the health of the medical student, entailed by what is practically continuous study for an average period of from six to seven years without a break, in an atmosphere which too often must be regarded as unhealthy, particularly in the latter, clinical, stage, which he is required to spend at a hospital. This part of your editorial was the subject of a leader in the *Times* of Sept. 1st, which remarks that "a burden of responsibility rests upon those to whose hands the education of medical students is committed."

A recent correspondence in your columns has shown that this responsibility is shared by so many bodies that almost no control is, or can be, exercised. That this is the position is demonstrated by the lamentable failure to deal with the scandal of a swollen medical curriculum crying out for diminution and actually receiving extension, because nobody is courageous enough to make a stand against quite impossible demands. The General Medical Council, which ought to have the power of control and, as I believe, has the statutory sanction, has become a subservient servant of the medical schools, which openly scoff at its authority. I have recently pointed out in your columns that the new curriculum formulated by the General Medical Council, to become operative next year, will make it necessary for the medical student in the last three years of his course—i.e., the hospital period obviously most exposed to infection and strain—to forego his vacations entirely. The relevant resolution says explicitly that during these three years "clinical instruction should be continuous" —for twelve months in each year!

Prof. Leathes, in your issue of July 10th, writing as chairman of the educational committee of the General Medical Council, excuses this transformation of academic into calendar years, by the statement that this continuous study "in London medical schools has been customary for at any rate more than fifty years." You have shown how great was the toll of sickness in these schools in the recent past, and the custom, if it indeed exists, which I question, is bad. But the custom has been no more than a voluntary and partial sacrifice of vacations, which is a very different thing from a compulsory and universal enforcement imposed on all the schools in Great Britain.

An editorial in the current issue of the *British Medical Journal* points out that for the minimal registrable qualification a minimal period of 57 months' training is exacted under present regulations, and goes on to point out that this assumes "that the student must keep in good health through every term and never fail at a single examination." These conditions are seldom, if ever, realised, and the average period of study for the minimal qualification is nearer six years than five, and for a university degree nearer seven years than six. With the proposed new compulsory appropriation of the long vacations in the last three years of study, the position which your leader deprecates will become the rule, and the break which you would make compulsory in the interest of the health of the student will, in fact, be rendered by regulation impossible of achievement throughout the clinical period. Moreover, the additional burden placed by the new curriculum upon the student in the pre-clinical period will inevitably result in a sacrifice of vacations in that stage also.

The final irony of this deplorable situation is the increasing dissatisfaction both lay and professional with the outcome of all this desperate effort, attended as it is by such great and intolerable strain upon the student. Clinical teaching, for so long the pride of English medicine, has been largely sacrificed to pseudo-scientific claims. Prof. Johnstone, at Belfast, said quite truly that under present conditions nurses receive a much better clinical training than medical students and the leader in the *Times* also condemns the neglect of clinical teaching resulting from the overloaded curriculum in a weighty paragraph with which I shall close my letter :—

"Must the minds of students be crammed with information which is contained in all the textbooks? The more some modern systems of professional education are examined the stronger the conviction grows that apprenticeship to a practitioner, the earlier method of training, possessed advantages which have been too lightly surrendered. Indeed it may well be that the natural order of procession towards efficiency and skill has been reversed and that, sooner or later, it will be necessary to go back. Most doctors assert that their knowledge was acquired not during but after their student days. Without accepting such statements in too liberal a sense, it may be well to weigh their implications. Men seek special knowledge eagerly when they have learned from their own experience that they have need of it. Until that time comes the ingestion of knowledge is usually of small avail and, as now appears, may impose too heavy a burden upon mind and body."

I am, Sir, yours faithfully,

Sept. 5th. E. GRAHAM-LITTLE.

To the Editor of THE LANCET

SIR,—The opinions quoted by the *Times* from your leading article of August 28th suggest that in some quarters an exaggerated view is held of the strenuousness of the life led to-day by medical students. The

fact, for example, that at the beginning of this century a group of hospital residents contracted tuberculosis cannot fairly be taken to reflect on modern conditions of hospital life.

The medical curriculum makes, of course, considerable demands on the student's time and energies. But when, recently, I got one of my colleagues to select 100 students and to ask them for their personal views on this particular point, almost all of them, to our surprise, expressed the opinion that they were not overworked. When I look at the question dispassionately I agree that they do not have to work too hard and that an exaggerated and rather sentimental view is taken of the whole matter. Students certainly do not have to work as hard as a general practitioner or (if the comparison may be allowed me) as the dean of a medical school, especially if he combines that office with consulting practice.

The question whether the health of students generally is adversely affected by their work is difficult to answer as facts are few and impressions (which may be misleading) are numerous. It is with the object of investigating this point that there has been established in this medical school a students' health service. But the following figures are interesting. During the past ten years, 1028 students have entered St. Bart.'s; 10 of them died and 8 failed to qualify through ill health. Of the 10 deaths 6 were the result of accidents. The number of those who had to relinquish the study of medicine owing to ill health was thus remarkably small.

The facilities afforded to the students for exercise are numerous. There is little teaching on Wednesday afternoons and none on Saturday afternoons, which gives greater opportunities than are available in many other walks of life. There are five rugby football teams, two association football teams, two hockey teams, two cricket teams. There is an active boxing club, a fencing club, an athletic club, a boat club, a lawn tennis club, a fives club, and others. Our school has a gymnasium, two squash rackets courts, two fives courts and cricket nets in the hospital grounds. Apart from all this many students, living some little distance from the hospital, have plenty of opportunities of joining clubs not connected with the school. Further, a swimming-pool is to be included in the development scheme now under consideration; but a large number of our students already avail themselves of a swimming-bath in another school.

These, or similar facilities, are to be found in most medical schools, and it cannot therefore be said that the students have not opportunities for exercise. Whether they utilise them to the full is of course their own concern. In writing thus I do not wish to make it appear that the student's life is an easy one, for it is not so. But I am sure that there is a tendency to exaggerate the difficulties and I do not believe that the strain on any normal student is such as to endanger his health.

I am, Sir, yours faithfully,

W. GIRLING BALL,
Dean of the Medical College, St. Bartholomew's Hospital.

Sept. 7th.

ITCHY RASHES DUE TO RABBIT MITES?

To the Editor of THE LANCET

SIR,—The autumn months are responsible for various itchy rashes, and a minute acarus, *Leptus autumnalis*, may be the cause. Usually the sufferers are hikers or golfers, who have walked in long grass, and the South Downs are well known to be infested. The irritation begins in about six hours and may last a week. The covered part of the legs is usually affected. The experience of two medical women last week-end may be of interest. They rested on the short dry turf in a place called Kingley Vale, Surrey, but after an hour decided to move on account of a slight skin irritation. Both during Sunday night began to suffer from intense irritation on the shoulders, back, and thighs. The legs, arms, face, neck, and the exposed V-shaped arch on the chest were not affected. The irritation continued all Monday, was slightly better after baths and calamine lotion, but Monday night was sleepless and fresh intensely itchy papules appeared round the waist and thighs.

When I saw one of them last Tuesday the irritation was still severe and the covered parts of the body showed small excoriated erythematous papules. No burrows were found and microscopic examination of scrapings showed nothing. A Collosol Sulphur bath and complete change of clothing gave immediate relief, and the rash disappeared in a few days. In several of my cases the sufferers have not been anywhere near long grass, but all agree that rabbits obviously inhabited the locality. It occurs to me that some of these cases are due to a rabbit mite. Can any of your readers support this explanation or suggest another?

I am, Sir, yours faithfully,

FLORENCE SHERRY-DOTTRIDGE.

Harley-street, W., Sept. 4th.

HOSPITAL PENSIONS

To the Editor of THE LANCET

SIR,—It is a matter of grave concern that hospital funds should be free from perversion or waste. With this in view I propose to deal with the subject of pensions. After ten years' experience of its working an extension of the superannuation scheme which now prevails in London and other hospitals is being officially contemplated. Assuming the need of some system of superannuation for hospital servants I doubt whether the scheme now in vogue is economical and appropriate.

In considering the scheme on its merits, one must recognise the advantage of having benefits interchangeable between the "participating institutions" (i.e., the hospitals, &c., members of the parent organisation [1]) so that a nurse, for instance, leaving one hospital for another, does not forfeit any vested interest; and this applies even where the change is from a hospital to private nursing. This is made possible by insurance offices undertaking the financial part of the work. The necessary fund is created by a deduction of 5 per cent. from an officer's salary and a grant of 10 per cent. by the hospital. May I first point out the nature of pensions in other cases? It is to continue a stipend, generally at a reduced figure, after the agreed age of retirement, and to meet an intermediate necessity, arising from abandonment of service, consequent upon ill health or other incapacity. A servant who resigns voluntarily forfeits any advantage from the scheme. To some extent the benefit is reciprocal, as a vested interest in an impending pension induces the holder to remain in employment, which may be a valuable asset to the employer. Further, the legitimate office of a pension is to benefit the individual, giving him the advantage of a guaranteed income for the rest of his life. The object should not be to endow his dependents or relations and certainly not strangers, as

[1] The superintending organisation is incorporated under the Companies Acts under the cumbrous title "The Federated Superannuation Scheme for Nurses and Hospital Officers (Contributory)," which, mercifully, may be referred to and known as "The Central Council."

nominees, it being left to him to exercise, with that object in view, such frugality as he would have done in the absence of a pension. It is true that civil service practice, primarily established upon this plan, has been so far modified that the servant upon his retirement may elect, instead of the benefit being entirely an annual payment to him, to be paid a certain proportion as a capital sum—but that is the only exception I know of.

Now, as will be seen, the hospital scheme has not primarily a pension but an insurance effect, and in place of the simplicity of the former the latter plan can only be gathered after intense study of literature of the most appalling complexity, issued by the Central Council. The scheme provides a choice by the servant of two forms of benefit: (1) "deferred annuity policies" and (2) "endowment assurances." The former secures at maturity an annuity or a single cash payment and provides for a return of all premiums with compound interest in the event of termination of membership, or death, before maturity. With regard to death there could hardly be a provision more inconsistent with a pension scheme than that a substantial sum should be paid to the representatives of a deceased officer. There is certainly the possibility of a pension, if the member should so choose upon maturity, but the alternative of a lump sum is to be deplored. A nurse or other unsophisticated servant may easily be tempted to embark the lump sum in some wild-cat scheme, with the result that she may become penniless in the end. How many defunct poultry farms are there owing to retired officers commuting their pensions? It is fair, however, to recognise that in the scheme there are some rules whereby the participating institution may exercise some control as to the application of the "proceeds" of policies; but even if such legislation is effective it is a bit of official interference with the private concerns of an individual. Superfluous litigation is here made possible, for the decision of one participating institution on the matter is not, it seems, sufficient; for there is provision for a series of appeals from the primary decision, culminating in the nomination of "a single arbitrator by the President of the Law Society."

How easy would it be to avoid all such complications by conferring only a genuine pension, that is, a regularly paid annuity! No one would begrudge a liberal grant in the case of a nurse, for example, who is compelled to retire in consequence of ill health, but, under the scheme, a nurse who voluntarily retires to contract a brilliant marriage, or a secretary who leaves hospital service to better himself, has the same advantages as the incapacitated. Instead of the inducement for a secretary to remain, as there would be in the ordinary practice of pensions, he is offered a substantial bonus when he departs. After he has been subject to the scheme for 10 years, for instance, his salary being (say) £1000 a year, he would be entitled to receive not only the 5 per cent. deducted from his salary but the 10 per cent. paid annually from the hospital funds, amounting to £1000, money subscribed by the public for the sick poor.

The alternative choice of "endowment assurance" secures a single cash payment on death before maturity or on survival to maturity, with the option of taking in lieu of cash payment an annuity at guaranteed rates, and is even more inconsistent with a real pension arrangement. Notwithstanding the full discretion given to a member to choose between the two plans it was felt that some advice should be given, and it is laid down that benefit (1) is usually more suitable for a nurse or woman officer, and benefit (2) for a married male officer.

That being headquarters' opinion it is to be regretted that nurses, at any rate, should not be protected from deciding that a (so-called) superannuation fund should be diverted for the purpose of enriching kin or others at their death. Under benefit (2) there is the same absence of distinction where intermediate abandonment is voluntary or on account of incapacity. I will give an illustration of abuse arising from the scheme.

A female officer chose to adopt benefit (2). Six years afterwards she was so ill that she had to abandon her employment and go to hospital, where she died a year later. Being unemployed in the meantime no money was available for the quarterly premiums of £10 1*s.*, but to save the policy from compulsory surrender some considerate persons advanced the premiums and so kept the policy alive. Otherwise all that was due to her was the surrender value of £250; actually £1302 17*s.*, the value of the policy, was paid upon her death by the assurance society. By her will the officer left £200 to a relation and the residue to her fiancé, with the result that an individual in no way connected with the hospital was enriched to the extent of over £1000.

Such a scandal may be often repeated. An officer might leave the whole policy benefit to his paramour to the exclusion of his wife and family, or (more innocently) to the National Society of non-smokers, the League for prohibition of cruel sports, or to homes for lost dogs. Meritorious as these objects may be, the money was not subscribed for them but for the sick poor.

Again, the cost of civil service pensions is only 10 per cent. of the yearly salary, a scheme of the education department costs only 7½ per cent., a hospital is now running its own scheme at a cost of 10 per cent. Compared with this the 15 per cent. cost of the superannuation scheme seems excessive. Is not the excess due to the introduction of the inappropriate life assurance element? It is difficult to understand how it is that committees of hospitals and kindred institutions, constituted as they are of persons of high standing and distinction, should have agreed to saddle their establishments with the burden of so extravagant and incongruous a scheme as that in force. The remedy seems to be that if a hospital chose to adopt an orthodox pension scheme the Central Council should allow the principle of interchangeability to apply.

I am, Sir, yours faithfully,

Junior Carlton Club, Sept. 2nd. FREDERICK MEAD.

SCURVY AND CARDITIS

To the Editor of THE LANCET

SIR,—In a previous communication I showed[1] that scurvy experimentally produced in guinea-pigs resulted in a diffuse carditis with valvular lesions, and that, if the scurvy were maintained in a subacute state for some months, congestive cardiac failure resulted. I failed to find any very definite correlation between the pathology of the scorbutic carditis and rheumatic carditis. Cardiac failure has been recorded in children dying of scurvy,[2] but it is not a usual finding.

By good fortune, I recently chanced to meet a South African colleague who, while working on a mine in Southern Rhodesia, saw more than 200 cases of scurvy in adult negroes. I at once asked him if any had shown signs of rheumatic carditis. He stated

[1] *Lancet*, 1937, **1**, 973.
[2] Erdheim, J., *Wien. klin. Wschr.* 1918, **31**, 1293.

that, in spite of the frequency of streptococcal infections, not only did the scorbutic negroes not get rheumatism, but that he had never seen rheumatism in any negro in that district. He had however seen some 30 cases of congestive cardiac failure in negroes with chronic scurvy. Until my question, it had never occurred to him that there was a causative association between the two conditions. The failure was not seen in blatant scurvy, but in middle-aged patients with long-standing subacute or chronic disease. Its features were cardiac enlargement, auricular fibrillation, an apical systolic murmur, and typical congestive failure. There were no signs suggestive of beri-beri. It appears that this is the human counterpart of the disease which I produced experimentally in my pigs.

I recorded the finding in my scorbutic pigs of multiple pyæmic abscesses. I was interested to learn that multiple non-tuberculous cold abscesses were one of the commonest findings in blatant scurvy. In the absence of treatment, these abscesses broke down to form "indolent tropical ulcers." The routine treatment of these abscesses consisted of free drainage, together with the intravenous injection of orange juice! Ordinary commercial orange juice was used; it was neutralised with sodium hydroxide and filtered before injection. So effective were these measures that the natives would present themselves for injection when they felt the preliminary symptoms of scurvy coming on. By the routine issue of orange juice scurvy has now been wiped out in the Rhodesian mines, but it is still seen among the natives of the outlying kraals.

One is forced to the conclusion that in scorbutic carditis we have a specific disease occurring in both man and guinea-pigs, leading in both to congestive failure if the scurvy is prolonged, and entirely unassociated, except for certain chance histological resemblances, with rheumatic carditis. I hope that this note may enable those—especially doctors in charge of primitive peoples—who see chronic scurvy and cardiac failure associated, to appreciate the possibility of a causative connexion, and to record the effect on the heart of energetic antiscorbutic treatment.

I am, Sir, yours faithfully,

STEPHEN TAYLOR.

Royal Free Hospital, Gray's Inn-road, W.C., Sept. 2nd.

QUININE FOR THREADWORMS

To the Editor of THE LANCET

SIR,—Two or three years ago I was attending a rather elderly patient of minef or threadworms, which had for some long time caused him a great deal of inconvenience, but my efforts to remove them proved of no avail. Some months later when attending him for an entirely different complaint, I casually asked whether he was still troubled by the worms, and to my surprise he replied that they had completely disappeared. When I asked him the reason, he said that the only thing he could think of was after taking ammoniated tincture of quinine for a cold he had seen no more of them. As a result of this I thought that I would try the effect of quinine on other patients with the same disease, and I found to my pleasure that a few doses of the drug in all cases and in sufferers of all ages, completely got rid of the worms. I have looked up the uses of quinine in a good many books and find no mention of this particular one. Hence this letter.

I am, Sir, yours faithfully,

EDWARD A. MCANALLY.

Holland-street, W., Sept. 3rd.

THE SUPPLY OF MEASLES SERUM

To the Editor of THE LANCET

SIR,—May I supplement your note (p. 468) on the supply of measles serum by stating the reasons why I want to see a service of donors established. I have already set out in your columns (1934, **2**, 507) the results obtained in this borough during an earlier outbreak; outside this borough I find it is still imperfectly appreciated what a scourge measles can be amongst the young, particularly in institutional life. Measles heads the list of infectious diseases in its death-rate, and it leaves a trail of damaged lives, largely in ears and chests, but also in less obvious ways. Many years ago an outbreak in Wimbledon led to 43 deaths from measles alone; in one house 4 children died, 2 in the upstairs flat and 2 in the downstairs. The head master who took me round one of the schools said he could point out to me a number of children who had never been the same since an attack of measles, not only in their physical capacity but also in their mental capacity. They cannot, he said, concentrate in the same way, their intelligence seems somehow at fault, in fact they are totally different children and yet it is difficult to put one's finger on exactly what is wrong.

There is of course no possibility of wholesale inoculation for the purposes of prevention. Of the two methods employed at the present time the use of convalescent serum from children who have recently recovered from an attack of measles may be put out of court. The serum is difficult to obtain, as parents are naturally averse to having one of their young children bled for the benefit of another. The second method is to use the serum of young adults who have had measles, either unrelated volunteers or young parents on behalf of their children. Convalescent serum used to be regarded as much more efficient than adult serum; but Gunn's researches for the L.C.C. seem to show that it is little inferior. The serum can be given either in a full dose to produce temporary immunity, which may last about five weeks, or by giving half a dose to produce a modified attack with a day or two of indisposition followed by permanent immunity. I have tried both. In one school I used the full dosage to tide over the examination period for scholarships which was to determine some of the boys' careers. I had previously arranged with the Wellcome Research Laboratories that, in return for blood from suitable donors who had had measles, they would provide the doses requisite for immunisation. Serum was sent down the same day and 37 of the non-immune contacts injected; no further case arose. The blood to be returned was provided by the members of the staff. Later in a public-school outbreak 100 non-immune contacts were all inoculated with adult serum from the Wellcome Laboratories, the necessary blood being provided by junior members of the staff. Only one boy of the 100 was in any way ill and he had a sharp attack of pneumonia, with complete recovery. A report of this first attempt to immunise older boys in a public school is to appear in the annual report of the Medical Officers of Schools Association.

In my own district by the use of adult serum provided by the local rover scouts, I have managed by inoculating contacts to keep continuously open not only the isolation hospital but the local general hospital, despite outbreaks of measles. This splendid effort on the part of the local rover scouts led me to suggest to Lord Baden-Powell a nation-wide service with some sort of decoration as acknowledgment.

The British Red Cross will not (I think wisely) allow this service to be combined with the carefully typed blood donors for emergency service. In the case of measles serum there is no need for typing. While Lord Baden-Powell expressed his keen interest in the possibility his committee resolved not to make the final move, but to wait until the medical profession itself has made up its mind about the nation-wide value of such a scheme.

I feel strongly that the time has come when the profession should make a definite pronouncement of this kind. The protective efficiency is so high that I have no hesitation in recommending practitioners to press upon their local health officer to provide them with the kind of service provided in this area, to the untold benefit of the juvenile sufferers from measles. I am, Sir, yours faithfully,

ELWIN H. T. NASH.

Public Health Department, Hounslow.

IDENTICAL TWINS

To the Editor of THE LANCET

SIR,—May I make two comments on the annotation in your last issue? There is a frequently overlooked fallacy in the study of identical twins reared apart. Whereas binovular twins have independent placental circulations and presumably have very similar environments, only a minority of uniovular twins are in the same fortunate position. The majority have anastomoses in their circulations leading to an inequality of distribution of blood, which may of course be sufficiently great to cause death. It is at any rate quite possible in an inbred community, where ordinary siblings are much alike, for uniovular twins to differ more than binovular at birth. Unless an attempt is made to subdivide identical twins into presumably dichorionic, and the more usual monochorionic, it is unjustifiable to assume that differences are due to the postnatal environment.

Psychological qualities appear particularly affected by comparative vigour at birth. It is unfortunate that Newman's material, which was inevitably far from a random sample and which is difficult to control, should have been devoted to ends for which it is poorly suited. It is, too, a pity that valuable data on the development of teeth, jaws, nose, throat, and sinuses, sepsis, and rheumatism have not been more carefully tabulated. In all probability the development of the face, quite as important as that of the soul, depends not only on infant vigour, but also on food, climate, hygiene, speech habits, &c., and concrete evidence, for propaganda, would have been welcome.

My second comment concerns the vexed question of mirror imagery in twins, which you raise. Prof. Newman many years ago pinned his faith to the experimental work of Spemann,[1] that if an embryo is divided sufficiently late, mirror imagery of the organs of the resulting twins will occur. Somehow or other the statement has crept into the world literature and is continually repeated that organ reversal is common in Siamese twins. This statement appears to be due to careless reading of Allen's 1875 account[2] of the partial post-mortem on the original Siamese twins and of Chapot Prévost's paper[3] on Mary and Rosaline, 1901. Reference to the originals will show that they contain no evidence of mirror imagery at all. Four other cases in the literature where partial inversion is described in one member of an identical twin pair are also all open to considerable doubt.

The extent to which mirror imagery of superficial details is more frequent in identical than in fraternal twins is by no means settled. Certain twin experts who believe in it use it as a point in the diagnosis of identity and then proceed to argue in a circle that it occurs more often in identical twins. At present surely it is wiser to follow the teaching of the Kaiser Wilhelm Institüt at Berlin, which has possibly one hundredfold greater twin material at its disposal than any other institute, that mirror imagery is due principally to forces external to the developing ovum.

I am, Sir, yours faithfully,

DENYS JENNINGS.

Belsyre Court, Oxford, Sept. 3rd.

To the Editor of THE LANCET

SIR,—Touching on the similarities found to exist in identical twins, the following cases seem of interest. These twins, 19 years old, appeared exactly alike in voice, build, and looks. Each had asthma. Reports on examination of the blood-serum by the differential sedimentation test gave a very unusual picture, exactly similar in each case. The intestinal flora of each showed less than 5 per cent. of normal coliforms. The predominant organism in each case was an enterococcus, which after incubation for 24 hours in their respective bloods grew out in pure culture in all three dilutions. Two varieties of *Streptococcus viridans* were isolated from the post-nasal swab from each, which were negative on pathogen selective blood culture. It would thus appear that identical twins may show similarities of physiological and bacteriological as well as those of anatomical and psychological nature.

I am, Sir, yours faithfully,

London, W., Sept. 7th. FRANK COKE.

SOMNIFAINE NARCOSIS

To the Editor of THE LANCET

SIR,—I have read with great interest Dr. Menzies's article on the Technique of Somnifaine Narcosis in your issue of Sept. 4th. My curiosity was particularly stimulated by his assertions that no disorder of carbohydrate metabolism exists during narcosis and that insulin as an adjunct is useless "only adding to the difficulties and anxieties of the narcosis." Furthermore, it is stated that when ketosis does occur it is the result of starvation. No doubt starvation, on those rare occasions when it does occur, increases the danger of ketosis, but it entirely fails to explain the disturbance of carbohydrate metabolism in the vast majority of patients who receive adequate nourishment during their treatment. Before adopting the insulin modification I carried out a number of investigations with somnifaine alone. Out of 20 treatments ketonuria developed in 14. In one of the patients it actually came on within 24 hours, though the average time was 3 to 4 days. With these cases there was no question of insufficient nourishment; in fact solid food had been given them. Insulin was tried because it was found that glucose alone did not cure the ketosis. In many cases the dose of insulin had to be increased as ketonuria reappeared later during the course. Is it possible for a patient to be reduced to starvation within 24 hours on a semi-solid diet? Furthermore, it has been shown at the Cardiff City Mental Hospital that patients undergoing prolonged narcosis exhibit diminished glucose tolerance and an increased hyperglycæmic index. The number of

[1] Spemann, H., *Arch. EntwMech. Org.* 1922, **52**, 95.
[2] Allen, H. *Trans. Coll. Phys. Philad.* 1875, **8**, 3.
[3] Chapot Prévost, *C.R. Acad. Sci. Paris*, 1901, **132**, 223.

treatments carried out at Cardiff and Runwell must by now amount to several hundreds, and no fatalities have occurred. At a number of other hospitals in this country (vide the annual report of the Devon Mental Hospital, 1936) and abroad the modification has been introduced with success and no one has remarked on the deleterious effect of insulin. Dr. Menzies, however, has failed to complete the course of narcosis in a number of cases and has had to resort to Coramine in three of them. I think a fair explanation of Dr. Menzies's failure with the insulin modification (six cases only) will be found in my letter in your issue of April 4th, 1936.

There are many other points with which most psychiatrists would express disagreement—e.g., the giving of the injection at fixed times, the supposed amnesia on 2 c.cm. of somnifaine per day, and the grouping of patients into classes from the point of view of tolerance, when each case should be studied on its own merits.

Somnifaine narcosis has gradually established itself as a valuable form of therapy, and every psychiatrist who has given it a trial would welcome a technique rendering it even safer. Until the theory of disturbed carbohydrate metabolism has been disproved by careful clinical and biochemical investigations, or some new utopian narcotic discovered, nothing can be gained by omitting the administration of glucose and insulin.

I am, Sir, yours faithfully,
R. STRÖM-OLSEN.

Runwell Hospital, Wickford, Essex, Sept. 6th.

AN INFORMATIVE LIPOMA

To the Editor of THE LANCET

SIR,—I should like to report a rather curious phenomenon which I came across recently. An elderly man, suffering from old-standing pulmonary tuberculosis of the fibroid type, attended at one of my sessions at Stepney Dispensary. Situated just above the left elbow-joint and on the anterior aspect of the arm was a lipoma of about the same size and shape as a well-developed female breast. When I commented on this, he informed me that it was to him an infallible guide as to whether he had gained or lost weight—distinctly varying in size. At this particular attendance he had actually gained a pound or two and told me he knew it without reference to the scale. Truly a fatty reservoir.

I am, Sir, yours faithfully,
DENNIS G. HAMILTON.

St. Mary Abbots-terrace, W., Sept. 5th.

REGIONAL OR DISTAL ILEITIS

To the Editor of THE LANCET

SIR,—In your issue of June 26th last I called attention to the early reports of cases of terminal ileitis by Combe and Saunders (July 4th, 1806), and by John Abercrombie (patient seen in 1814, reported in his book 1828). An interesting editorial on "regional ileitis," appearing in the *Journal of the American Medical Association* for July 31st, leads me to call attention to several additional references, and particularly to the report by T. K. Dalziel, of Glasgow, on "chronic interstitial enteritis" (*Brit. med. J.* 1913, **2**, 1068). Dalziel saw the first of these localised cases of chronic ("hyperplastic") interstitial enteritis with Prof. Gemmell in 1905; and of particular interest is the case of a child of ten, showing great thickening of the ileum; middle section of ileum was removed. Dalziel operated upon a professional colleague in 1901, suffering from obstruction of the bowel, colic, &c., and found "rigidly fixed gut" at the operation. He also mentions a lady patient of Dr. Revie, of Kilmarnock, suffering from regional ileo-colitis; a colostomy was done on the right side by Dalziel. No tuberculosis was present. Seven out of nine cases recovered after operation (resection of large portions of the intestine).

Of interest in this connexion are the following publications:—

Le Dentu. Faux cancers et tumeurs inflammatoires du ventre, *Gaz. méd. Paris*, 1909, No. 50, p. 5; also *Bull. Acad. Méd. Paris*, 1909, **62**, 289. Faux cancers et tumeurs inflammatoires du ventre, *Sem. gynéc.* 1909, **14**, 369; *Bull. méd. Paris*, 1909, **23**, 1037; De l'exclusion intestinale, *Rev. Gynéc.* 1899, **3**, 81.

H. Braun. Ueber entzündliche Geschwülste am Darm, *Dtsch. Z. Chir.* 1909, **100**, 1.

Graser. Darmstenose bedingt durch Perforation multipler falscher Divertikel, *Verh. dtsch. Ges. Chir.* 1898, **27**, 98.

I am, Sir, yours faithfully,
HYMAN I. GOLDSTEIN.

Camden, New Jersey, U.S.A., July 31st.

OBITUARY

CHARLES CARTER BRAINE, F.R.C.S. Eng.

THE death on Sept. 1st of Mr. Carter Braine in his seventy-ninth year severs a long family association with Charing Cross Hospital. For thirty years he was surgeon anæsthetist to the hospital, and his father, Francis Woodhouse Braine, F.R.C.S., had been chloroformist there in the days when J. T. Clover was making anæsthetics a specialty at University College Hospital. The elder Braine was a pioneer in dental gas which he made at home and carried round with him in a balloon strapped on his back, helped by his son. He was a St. George's man, but Carter Braine naturally studied at Charing Cross from which he qualified in 1887 to become house surgeon and assistant demonstrator of anatomy and physiology. After taking the fellowship in 1890 he was appointed anæsthetist to the hospital and held the appointment until 1919 when he retired under the age-limit; but he continued in private practice, limiting his attendance to dental operations in his later years. He was a capable administrator, doing his work without fuss or fads. He lectured on anæsthetics at the hospital and was the author with A. S. Underwood of a popular manual on anæsthetics in dental surgery. He was also anæsthetist to King George, the Royal Dental, and St. Peter's hospitals. He did a good deal to make anæsthetic apparatus both more handy and more safe, and forty years ago he described a simple contrivance for administering air in combination with nitrous oxide. He improved the Ormsby and Junker inhalers, devising a form of the latter which, had it then come into general use, would have prevented a number of fatal accidents.

Carter Braine was a prominent mason. He was a founder of the Chère Reine Lodge and the William Harvey Chapter and secretary of the lodge for some years. He was past grand deacon of the United Grand Lodge of England and past assistant grand sojourner. His friends always spoke of him with affection—he was never known to fail anyone in need—and in the Wimpole-street neighbourhood the figure of a man carrying a large black bag and accompanied by a small white dog was for many a welcome sight. Mr. Carter Braine leaves a widow and two sons, one of whom is assistant surgeon to the X ray department at Guy's.

PUBLIC HEALTH

Bristol Health Centres

WITH a view to coördinating their medical services the health, education, and public assistance committees of Bristol are constructing a system of health centres consisting of a central headquarters surrounded by a ring of smaller centres to serve the outer districts. At each there will be accommodation for the infant welfare, antenatal, and dental clinics, and for school medical inspection and minor ailment treatment for all cases within its area, the specialist services being mainly carried on at the central clinic. Two of the peripheral centres are already working, and the central building was officially opened by Sir Farquhar Buzzard on July 9th.

This central building forms three sides of a square with its main entrance on Passage-street, and as its site is an island it has been possible to have separate entrances to the different clinics from the four surrounding streets. On the ground floor is the main waiting-hall for women and infants, with direct access to consulting- and weighing-rooms, a kitchen and a perambulator shelter. This floor also has dental surgeries, a light room, a dispensary, plaster and X ray rooms, and consulting- and waiting-rooms for tuberculous patients. The main corridor runs the length of the building and has a staircase at either end, and there is a passenger lift large enough to take stretcher cases. The first floor contains an office for record clerks with a Lamson Tube station communicating with all departments, and a smaller office for the medical officer of health, a library, and staff dining- and retiring-rooms. Over the main waiting-hall is a waiting-room for school-children, and there are rooms for school medical inspections and the specialist clinics with an electrocardiograph and a fully equipped orthopædic treatment room. The second and third floors are occupied respectively by rooms for health and district visitors and the caretaker's flat. The water for the domestic supply and for warming the building is electrically heated in the basement during the night, and stored in large vessels for use during the day, and the other internal fittings and decorations have been planned to need a minimum of attention.

The building is one which may well serve as a model for the construction of such centres in other areas.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 28TH, 1937

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 1195; diphtheria, 910; enteric fever, 57; pneumonia (primary or influenzal), 318; puerperal fever, 46; puerperal pyrexia, 139; cerebro-spinal fever, 13; acute poliomyelitis, 40; acute polio-encephalitis, 4; encephalitis lethargica, 5; relapsing fever, 1 (North Westmorland); dysentery, 23; ophthalmia neonatorum, 115. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Sept. 3rd was 2667, which included: Scarlet fever, 585; diphtheria, 651 (diphtheria carriers, 24); measles, 151; whooping-cough, 435; puerperal fever, 24 mothers (plus 11 babies); encephalitis lethargica, 284; poliomyelitis, 7. At St. Margaret's Hospital there were 23 babies (plus 9 mothers) with ophthalmia neonatorum.

Deaths.—In 124 great towns, including London, there was no death from small-pox, 5 (2) from enteric fever, 4 (0) from measles, 3 (2) from scarlet fever, 18 (3) from whooping-cough, 23 (1) from diphtheria, 34 (7) from diarrhœa and enteritis under two years, and 14(2) from influenza. The figures in parentheses are those for London itself.

Edmonton, Bootle, and Leeds each reported a death from enteric fever. Liverpool had 3 deaths from whooping-cough, West Bromwich 2. Diphtheria was fatal in 17 great towns: in 3 cases each at Liverpool and Sunderland. Five deaths from diarrhœa were reported from Liverpool, no more than 2 from any other large town.

The number of stillbirths notified during the week was 268 (corresponding to a rate of 39 per 1000 total births), including 44 in London.

MEDICAL NEWS

University of Glasgow

Prof. George Barger, F.R.S., who holds the chair of chemistry in relation to medicine in the University of Edinburgh, has been appointed regius professor of chemistry in the university in succession to Prof. George Henderson, who has resigned.

Royal Faculty of Physicians and Surgeons of Glasgow

At a meeting of the Faculty held on Sept. 6th, with Prof. Archibald Young, the president, in the chair, the following were admitted to the fellowship:

Paresh Nath Baruah, M.B. (Edinburgh), Alfred Finlay Brown, M.B. (Glasgow), Enrique Eduerdo Krapf, M.D. (London), and Edwin Stewart Lawrie, M.B. (Edinburgh).

Middlesex Hospital

The annual dinner of the medical school will be held on Friday Oct. 1st, at 7.30 P.M., at the Savoy Hotel, when Dr. Douglas McAlpine will be in the chair.

St. George's Hospital

The annual prize distribution will be held in the board room of the hospital at 3 P.M., on Saturday, Oct. 2nd. Mr. W. R. Halliday, LL.D., principal of King's College, London, will give the inaugural address.

St. Thomas's Hospital, London

On Thursday, Oct. 14th, at 2.45 P.M., Queen Mary will open Riddell House, the new nurses' home which has been given to the hospital by Lady Riddell as a memorial to her husband.

Epsom College

Later on in the year the council of the college will award two France pensions of £30 per annum each to duly qualified medical men in reduced circumstances. Candidates must be not less than 55 years of age, and, if single, must not be in receipt of an income, independently of any allowance from the College or the Royal Medical Benevolent Fund, of more than £100 per annum. If married, the combined incomes of the candidate and his wife must not exceed £150 per annum. Forms of application may be obtained from the secretary, 49, Bedford-square, London, W.C.1.

Plastic Surgery Congress

The second European congress of structive (plastic) surgery will be held at the house of the Royal Society of Medicine, 1, Wimpole-street, London, W., on Oct. 6th and 7th. Sir Harold Gillies is president of the committee of honour and Mr. T. Pomfret Kilner of the executive committee. The subjects for discussion are free skin grafts, the restoration of nasal contour, and mammaplasty. The office of the congress is at 149, Harley-street, London, W.1.

London's Domiciliary Midwifery Service

The proposals which the London County Council put forward towards the end of June for the provision of a domiciliary midwifery service, including maternity nursing for doctors' cases, have now been approved by the Minister of Health, and will be brought into operation on or before Jan. 1st, 1938. The proposals provide for (1) agreements to be made by the L.C.C. with some 40 voluntary organisations, who already provide domiciliary midwifery and maternity nursing, for the services of about 120 whole-time midwives, and (2) for the appointment directly by the Council, as a start, of 42 whole-time salaried midwives.

St. Bartholomew's Hospital

The annual dinner for old students will be held at this hospital on Friday, Oct. 1st, at 8 P.M., when Dr. C. M. Hinds Howell will be in the chair. The hon. secretaries for the dinner are Mr. Reginald Vick and Dr. Geoffrey Evans.

King's College Hospital

An intensive course of lectures and demonstrations open to all medical practitioners will be held at this hospital on Saturday, Oct. 23rd, and Sunday, Oct. 24th. The annual dinner of past and present students will take place on Saturday, Oct. 23rd, at the May Fair Hotel at 8 P.M., when Dr. J. A. Drake, the dean, will take the chair.

International Spa Congress

The Budapest Spa Association is holding an international congress in Budapest from Oct. 7th to 14th. Medical post-graduate congress will be held simultaneously with the congress, and the Royal Medical Society of Budapest will also celebrate its centenary. The office of the congress is at Dorottya utca 11, Budapest V.

Ramsey Cottage Hospital

The governor of the Isle of Man has opened an extension to this hospital, including a new operating-theatre and more accommodation for doctors and matron.

Medical Station in a Factory

The new medical station opened by I.C.I. Metals Limited, Birmingham, on August 30th is a further stage in the development of the medical service of Imperial Chemical Industries in that area. The new station now becomes the fourth on a site which covers some 280 acres and where approximately 7000 employees are engaged in the non-ferrous metal industry. It embodies much that is new for the first treatment of works injuries and is fitted with two side wards, each with two beds, where patients who have suffered serious injuries can be kept until such time as they have recovered from secondary shock and are fit to be sent to hospital.

Broadcasts of Medical Interest

In the National programme a series of practical talks on child welfare will be given by doctors between October and Christmas, dealing with children between the ages of two and five. On Oct. 10th a practising medical psychologist will give the first of five talks on personality and progress under the title of Family Life. Subsequent talks in October will be on youth, marriage, and old age and the years between. The Northern broadcasting station has arranged a series of fortnightly talks in which a psychologist will relate, in short story form, the histories of six children who have shown in one way or another that they are difficult to handle. The first story will be broadcast at 9.45 P.M. on Oct. 6th.

Child Welfare and the Fall in the Birth-rate

Speaking last Tuesday at the opening of a new maternity and child welfare centre at Glyn Neath, Sir Kingsley Wood, the Minister of Health, said a child population, healthy and sound, was more than ever important to-day, not only for the sake of the children but because the fall in the birth-rate had reduced the proportion of young lives in our population while the fall in the general death-rate had increased the proportion of the older people. Infant mortality in England and Wales remained at a low level and during the last ten years the rate of mortality has been less than half what it was at the beginning of the century. This had been largely due to the efforts of the State and the local authorities and voluntary agencies by the improvement in the environment of the child. Social, domestic, and sanitary and better housing conditions had played a great part. The arrangements for supervising the health of children under the age of eighteen months or two years was in the main satisfactory, but he desired to see a more systematic and periodical health visiting of all children under five who do not attend school. The further establishment in certain areas of special "toddlers' clinics" and of day nurseries was also well worth while. For children who were unhappily destitute local authorities had in the main spared no trouble in providing suitable homes; but perhaps the most important thing to-day was to find the right people to look after the children. Buildings were important but far less so than the staff. Public assistance authorities could do much in this way in giving boys and girls a real start in life. Children should not be retained in institutions but in homes under the guidance of people who studied their needs and made them useful citizens.

In Wales, said Sir Kingsley Wood, there had been a continued and considerable expansion of services. In 1926 there were 13 antenatal clinics at which about 10 per cent. of expectant mothers attended; to-day there were 104 such clinics and about 40 per cent. of the mothers attended them. In 1926 there were 250 infant welfare centres and there were over 300 to-day, and nearly 70 per cent. of the children under five attended them.

Chartered Society of Massage and Medical Gymnastics

The annual congress of this society will be held from Sept. 20th to 24th at the London School of Economics, Houghton-street, W.C. The founders' lecture will be given this year by Mr. H. A. T. Fairbank, who will speak on some unusual causes of backache. Other medical speakers at the congress will include Prof. G. R. Girdlestone (the treatment of scoliosis in an orthopædic hospital), Miss M. Forrester-Brown (the place of physiotherapy in the treatment of injuries), Mr. K. O. Parsons (treatment by manipulation), Mr. Lawrence Abel (the surgery of the sympathetic nervous system), Mr. J. G. Yates-Bell and Dr. F. S. Cooksey (faradism and pelvic floor exercises for urinary incontinence), Dr. A. T. Todd (a system of treatment for chronic rheumatism), Mr. D. McCrae Aitken (the respiratory reflex in association with exercises for spastics), Dr. Noel Harris (hysteria), Dr. Doris Odlum (psychological factors in physical disease), Mr. H. J. Seddon (the application of occupational therapy to orthopædic conditions), Dr. W. S. C. Copeman (chronic rheumatism), Mr. A. E. Porritt (ruptures—ancient and modern), Prof. E. W. Hey Groves (intracapsular fractures and their treatment). Mr. A. W. Adams (orthopædic and other operations under spinal anæsthesia), Dr. J. Kalmanson (indications for short-wave therapy), Dr. Clement Nicory (the importance of the physical therapeutist in preventive medicine), and Dr. R. L. Kerr (remedial exercises in the treatment of abnormalities of binocular vision and asthenopia). The society may be addressed at Tavistock House (North), Tavistock-square, London, W.C.1.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Sept. 14th.—9 P.M. (St. Mary's Hospital medical school), Dr. R. D. Lawrence: General Practitioners and Diabetic Emergencies.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

UNIVERSITY OF GLASGOW.
TUESDAY, Sept. 14th.—4.30 P.M. (Tennent Memorial Building, Church-street), Prof. A. J. Ballantyne: Hypertension, Vascular Sclerosis, and Renal Disease.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane-road, W.
WEDNESDAY, Sept. 15th.—Noon, clinical and pathological conference (medical).—3 P.M., clinical and pathological conference (surgical).
THURSDAY.—3 P.M., operative obstetrics.
Daily, 10 A.M. to 4 P.M., medical clinics, surgical clinics and operations, obstetrical and gynæcological clinics and operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Sept. 13th to SATURDAY, Sept. 18th.—ROYAL CHEST HOSPITAL, City-road, E.C., Mon., Wed., and Fri., 8 P.M., advanced course in chest and heart diseases.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W., Tues. and Thurs., 8 P.M., clinical and pathological M.R.C.P. course.—Plastic Surgery, Wed. and Thurs., all-day course at various hospitals.—MIDDLESEX HOSPITAL, W., Mon., Wed., and Fri., 5.30 P.M., primary F.R.C.S. physiology course.—Courses are open only to members of the fellowship.

Appointments

CONWAY, ALAN, M.B. Leeds, F.R.C.S. Edin., Resident Surgical Officer at the Royal Infirmary, Preston.

COPE, R. W., M.R.C.S. Eng., D.A., Anæsthetist to the Miller General Hospital, Greenwich.

GALPINE, J. F., M.D. Leeds., D.P.H., Resident Medical Officer of the City Isolation Hospital, Coventry.

HOUSTON, JOHN, M.B. Glasg., D.P.H., Deputy Medical Superintendent at Abergele Sanatorium.

ORMSTON, R. M. A., L.R.C.P. Edin., Assistant School Medical Officer for the County of Durham.

READ, R. A., M.B. Edin., D.P.H., Assistant Medical Officer of Health and Assistant School Medical Officer for Cambridge.

ROSS, A. I., M.B. Edin., Second Resident Assistant Medical Officer at Baguley Sanatorium.

Preston County Council.—The following appointments are announced:—

PORTER, J. H., M.B. Camb., D.P.H., Chief Assistant County Medical Officer of Health;

PICKUP, J. W., M.D. Liverp., D.P.H., Assistant County Medical Officer of Health; and

WADE, C. H., M.D. Manch., D.P.H., Assistant County Medical Officer of Health.

Royal Maternity Hospital, Belfast.—The following appointments are announced:—

BOYD, A. M., M.B. Belf., Resident Medical Officer;

ROULSTON, ENID B., M.B. Belf., Resident Medical Officer in Charge of the Rea Block (Isolation); and

BROOKE, A. K., M.B. Edin., Resident Medical Officer.

Certifying Surgeon under the Factory and Workshop Acts: Dr. L. A. LEWIS (Calvert District, Buckingham).

Medical Referee under the Workmen's Compensation Act, 1925, H. I. DEITCH, M.B., F.R.C.S., for the Dewsbury, Leeds, Otley, and Wakefield County Court Districts (Circuit No. 14).

Medical Referee under the Workmen's Compensation Act, 1925: ALEXANDER GARROW, M.D., of Glasgow, for the Sheriffdom of Lanark with a view to his being employed in ophthalmic cases.

Vacancies

For further information refer to the advertisement columns

Acton Hosp., W.—Cas. O., at rate of £150.

Aylesbury, Royal Buckinghamshire Hosp.—Sen. and Jun. Res. M.O.'s, £200 and £150 respectively.

Barnsley, Beckett Hosp. and Dispensary.—Res. Surg. O., £300.

Birmingham Children's Hosp.—Res. and Asst. Res. M.O.'s, £175 and £125 respectively.

Birmingham, Erdington House.—Asst. Res. M.O., £300.

Birmingham, Little Bromwich Hosp. for Infectious Diseases.—Two Jun. Res. M.O.'s, each £300.

Birmingham Maternity Hosp.—H.S., at rate of £75.

Bradford Children's Hosp.—H.P., £150.

Brighton Municipal Hosp.—Third Res. Asst. M.O., £300.

Brighton, New Sussex Hosp. for Women, Windlesham-road.—Hon. Med. Reg. Also Clin. Asst. to Eye Dept.

Bristol, Southmead Municipal General Hosp.—Jun. Asst. Res. M.O., at rate of £200.

Burnley, Victoria Hosp.—H.S., at rate of £150.

Cambridge, Addenbrooke's Hosp.—Res. Anæsthetist and Emergency Officer. Also H.P., each at rate of £130.

Canterbury, New Kent and Canterbury Hosp.—H.S. to Special Depts., at rate of £125.

Cardiff, King Edward VII Welsh National Memorial Association. Asst. Res. M.O.'s to North Wales Sanatorium and Glan Ely Hosp., each £200.

Cardiff Royal Infirmary.—Hon. Asst. Ophth. Surgeon.

Chester Royal Infirmary.—H.S., £150.

Dewsbury and District General Infirmary.—Sen. H.S., £200.

Doncaster Royal Infirmary.—H.P., £175.

Dreadnought Hosp., Greenwich, S.E.—Receiving Room Officer, at rate of £200.

Dudley, Guest Hosp.—Two H.S.'s, each at rate of £100–£130.

Dumfries, Crichton Royal.—H.P., £200.

Ealing, Borough.—Deputy M.O.H., £750.

Ealing, King Edward Memorial Hosp.—Reg. M.O. and Cas. H.S., at rate of £275 and £150 respectively.

Edinburgh Royal Infirmary.—Clin. Asst. for Ear, Nose, and Throat Dept., £100.

Elizabeth Garrett Anderson Hosp., Euston-road, N.W.—Clin. Assts. in Med. and Surg. Depts., Hon. Physician to Children's Dept., Med. Reg., £100. Also Third H.S., at rate of £50.

General Post Office.—Two Asst. M.O.'s for Headquarters Medical Branch, each £500.

Glasgow Corporation Mental Hosp. Service.—Jun. Asst. Phys. for Hawkhead Mental Hosp., £325.

Great Yarmouth General Hosp.—H.S., at rate of £140.

Guildford, Royal Surrey County Hosp.—H.S. and H.P., each at rate of £150.

Hosp. for Sick Children, Great Ormond-street, W.C.—Res. Surg. O., £200. Also Res. H.P. and Res. H.S., each at rate of £100.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.S., at rate of £75.

Hounslow Hosp.—Res. M.O., £250.

Hove General Hosp.—Sen. and Jun. Res. M.O.'s, £150 and £120 respectively.

Hull Corporation Health Dept.—Asst. M.O.H. for Port Sanitary Work, £600.

Ilford, King George Hosp.—Res. Anæsthetist, and H.P., at rate of £150.

Infants Hosp., Vincent-square, Westminster, S.W.—Pathologist, £700. Also H.P., at rate of £100.

Ipswich, East Suffolk and Ipswich Hosp.—H.S., £144.

Leamington Spa, Warneford General Hosp.—H.P. and H.S., each at rate of £150. Also Cas. O. and Jun. H.S., at rate of £150.

Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O., at rate of £200.

London and Counties Medical Protection Society, Ltd., Victory House, Leicester-square, W.C.—Secretary, £1250.

London County Council.—Infectious Hosps.: Asst. M.O.'s, Grades 1 and 2, £350 and £250 respectively.

London County Council.—Two Part-time Obstetricians and Gynæcologists, £800 and £600. Asst. Pathologist, £650.

London Hosp. Medical College, E.—Demonstrator in Anatomy, £400.

London Lock Hosp., 283, Harrow-road, W.—Res. M.O. to Female Depts., at rate of £175.

London University.—Crombie-Ross Lectureship in Psycho-Pathology, £650.

Maidstone, Kent County Ophthalmic and Aural Hosp.—Sen. and Jun. Ophth. H.S.'s, at rate of £250 and £200 respectively.

Manchester, Christie Hosp. and Holt Radium Institute, Withington.—Res. M.O., at rate of £150.

Manchester Hosp. for Consumption and Diseases of the Throat and Chest.—Asst. M.O. for Crossley Sanatorium, £200.

Manchester, Monsall Hosp. for Infectious Diseases.—Two Res. Asst. M.O.'s, each at rate of £250.

Manchester, St. Mary's Hosp.—H.S.'s to Special Depts., each at rate of £50.

Mansfield, Harlow Wood Orthopædic Hosp.—H.S. at rate of £200.

Merthyr Tydfil County Borough.—Asst. M.O.H. and Asst. School M.O., £500.

Middlesbrough, Holgate Municipal Hosp.—Asst. Res. M.O., £270.

National Hosp. for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. and Out-patient M.O., at rate of £150 and £125 respectively.

National Temperance Hosp., Hampstead-road, N.W.—Cas. O., at rate of £120. Also Hon. Dermatologist.

Newcastle General Hosp.—Surg. Reg., £250.

New Zealand, Palmerston North Hosp.—Res. M.O. and Reg. £450.

Nottingham General Hosp.—H.P., at rate of £150.

Pembroke County War Memorial Hosp., Haverfordwest.—Res. H.S., £200.

Plaistow Fever Hosp., E.—Jun. Asst. M.O., £300.

Preston and County of Lancaster Royal Infirmary.—H.S. to Eye, Ear, Nose, and Throat Dept., £150.

Preston, Wrightington Hosp., Appley Bridge.—Jun. Asst. M.O., £200.

Princess Beatrice Hosp., Earl's Court, S.W.—Hon. Asst. Obstet. Phys. and Gynæcologist. Res. Surg. O., at rate of £200. H.P. and Cas. O., and Cas O. and Obstet. H.S., each at rate of £110.

Princess Louise Kensington Hosp. for Children, St. Quintin-avenue, W.—H.P., at rate of £120–£150.

Royal London Ophthalmic Hosp., City-road, E.C.—Refraction Asst. L.C.C. School Dept., £160, Sen. Res. Officer, at rate of £150. Also Out-Patient Officer, £100.

Royal National Orthopædic Hosp.—Two H.S.'s, each at rate of £250.

Royal Waterloo Hosp. for Children and Women, Waterloo-road, S.E.—Res. Cas. and Orthopædic H.S., at rate of £150.

St. Bartholomew's Hosp., E.C.—Ophth. Surgeon.

St. John's Hosp., Lewisham, S.E.—Clin. Asst. to M.O. in charge of the Electrical Massage Dept. Also Med. Reg. to Out-Patient Dept., each 50 guineas.

St. Leonards-on-Sea, Buchanan Hosp.—H.S., £125.

Salisbury General Infirmary.—H.S., at rate of £125.

Salvation Army Mothers' Hosp., Clapton, E.—Jun. Res. M.O., at rate of £80.

Scarborough Hosp.—Two H.S.'s, each at rate of £150.

Smethwick County Borough.—Sen. Asst. M.O.H. and Asst. School M.O., £650.

Southampton, Royal South Hants and Southampton Hosp.—Res. Anæsthetist and H.S. to Ear, Nose, and Throat Dept., at rate of £150.

Southend-on-Sea General Hosp.—H.P., at rate of £100.

South Mimms, Clare Hall County (Tuberculosis) Sanatorium.—Res. Asst. M.O., £400.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Two H.S.'s, each at rate of £150.

Swansea General and Eye Hosp.—Locum H.S. to Ear, Nose, and Throat and Ophth. Depts., 5 guineas a week.

Wakefield, Clayton Hosp.—H.S., at rate of £200.

Warrington Infirmary and Dispensary.—Third Resident, at rate of £150.

West London Hosp., Hammersmith, W.—Res. Anæsthetist, at rate of £100.

Westminster Hosp., Broad Sanctuary, S.W.—Wander Scholarship, £250.

Wigan Royal Albert Edward Infirmary.—Res. Med. and Surg. O. and Reg. £250.

Willesden General Hosp., Harlesden-road, N.W.—Cas. O., at rate of £100.

Willesden Municipal (Fever) Hosp., Brentfield-road, N.W.—Res. M. O., £250.

Woolwich and District War Memorial Hosp., Shooters Hill, S.E.—Res. Surg. O., £175.

Worcestershire County Council—Asst. Tuber. O., £600.

Wrexham and East Denbighshire War Memorial Hosp.—Res. H.S. for Spec. Depts., at rate of £150.

Medical Referee under the Workmen's Compensation Act, 1925, for the Appleby; Brampton; Carlisle; Haltwhistle and Alston; Penrith; and Wigton County Court District (Circuit No. 3). Applications should be addressed, the Private Secretary, Home Office, Whitehall, London, S.W.1, before Sept. 25th.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Sidcup (Kent) and Newquay (Cornwall).

NOTES, COMMENTS, AND ABSTRACTS

BLUNDERS OF PLAIN MUSCLE
DUE TO ALLERGY OR ANXIETY STATES

By Frank C. Eve, M.D. Camb., F.R.C.P. Lond.

The practical study of the misconduct of plain muscle illustrates compactly the present trends of clinical medicine. Other tissues of the body seldom go astray, but plain muscle misbehaves nowadays in half our patients. When we reflect that it forms the walls of all the contractile tubing and sacs of the body we realise that our daily health and happiness and efficiency depend entirely on plain muscle doing its duties properly. For these tubes propel the aliment in the gut, the blood in its vessels, the air in the bronchi, the urine and the bile in their ducts, and deal with the varying contents of the uterus. In all these tubes and chambers the traffic must be regulated with nicety and the tension properly maintained. In any of them, a hold-up of the traffic entails pain from hypertension, and this is the cause of all non-inflammatory abdominal pain.

What do I mean by a blunder of plain muscle? Every patient displays some abnormality. We must first ask ourselves, "Is the abnormality maleficent, beneficent, or unimportant?" Hyperpyrexia for instance is maleficent and must be fought: moderate pyrexia in pneumonia is beneficent and should be encouraged. Similarly with moderate or excessive pleural effusions. Certain heart murmurs are clinically unimportant. Hence, by a blunder of plain muscle, I mean an action which has a maleficent effect on the body—even if it satisfies an abnormal subconscious mind. Thus a neurotic abnormality is one which does not conduce to successful living. Of course we must not blame plain muscle for its blunders but the autonomic system (or higher centres) whose commands it obeys. Space does not allow any consideration of the secretory blunders of the autonomic system—e.g., mucous colitis.

I have come to believe that this outlying involuntary nervous system carries out its constant duties with an animal-like perfection unless it is interfered with by impulses from the central nervous system—mainly of anxiety in those of a sensitive, striving, idealistic temperament. In fact I would submit the aphorism, "The frustrated subconscious uses the autonomic system as its secret avenger, and spasm is commonly its sword." This method by which the subconscious attains its ends is so subtle that doctors never suspected its machinations until recently. The method of producing spasm or paralysis of voluntary striped muscle was far more crude and more easily detected; nowadays it occurs only in the simpler minds—e.g., girls, and privates in the war.

This aphorism conveys the main intention of this paper; but we have also to eliminate allergic or reflex spasms to which these sensitive temperaments are liable. (Always we have to investigate and treat the body and mind as an inseparable unity.) We know that plain muscle is not amenable to the will (unless in Yogis), but the maiden's blush and the diarrhœa of the nervous examinee show that it is susceptible to the emotions.

The effect of chronic anxiety is illustrated by the case of an elderly idealistic and religious doctor in whom constipation increased slowly to chronic obstruction. At the operation, the ascending colon was enormously dilated and hypertrophied as far as the midline, where it suddenly became normal. Though inexplicable at the time, my later studies of plain muscle leave no doubt in my mind that spasm in the left colon caused the obstruction. This was confirmed many years later when his anxious idealistic daughter, aged 40, consulted me for increasing constipation demanding 20 senna pods daily. X rays showed spasm of the left colon and dilatation of the right, similar to her father's but far less advanced. After a year of bromide, belladonna, and paraffin she was gradually weaned of her senna (which increases spasm). Nowadays (1937) I should try to strengthen the weak left vagus by weakening its opponent (sympathetic) by means of ergotamine.

Another patient, who illustrated crisply the effect of mind on body, was a thin, anxious, restless, elderly lady whose digestion had long been impaired by residence in the East. From fear of cancer, her doctor (in another city) insisted on X ray to which she greatly objected. After 6 hours none of the meal had passed the pylorus, and after 24 hours there was much remaining in the large atonic stomach. Naturally the diagnosis was organic pyloric obstruction, with operation imperative. Knowing her temperament and the wicked ways of plain muscle I asked to see the skiagrams before proceeding further. They seemed compatible with anxious spasm; and dieting in bed, with bromide and belladonna, restored her health and gained her a stone in weight. At the X ray examination her mind was in mutiny and so was her stomach. After 3 months she was again X rayed, here and willingly: the small, tonic stomach emptied in 2 hours, and operation was avoided. Four years later she is still well.

Another thin, anxious woman, past middle age, had dysphagia and small, non-acid vomits. Evidently there was spasm at the upper and lower ends of the gullet. X rays confirmed this, and the spindle-shaped bolus could be seen to descend an inch with deglutition and then to spring back elastically.

SPASM IN THE INFANT

Throughout this paper I shall, for simplicity, use the word spasm when the term achalasia—that illuminating conception of Hurst, meaning inability to relax—may often be more appropriate. In advanced cardiospasm, achalasia is associated with degeneration of Auerbach's plexus—the first neurosis with demonstrable cause. I presume that achalasia means too weak a vagus and spasm a sympathetic too strong; and yet atropine succeeds in achalasia!

Cardiospasm in the infant is far more acute and fatal than in the adult. In the adult, when the food accumulates to a height of 8 to 10 inches, its weight is sufficient to overcome the achalasia; in the infant the gullet is too short for this relief, and the danger of overflow into the trachea is very great. This killed my first case, by deglutition pneumonia, because I did not get atropine given boldly enough; a drachm of tinct. belladonnæ daily failed to dilate the pupils in the first 5 days, and the baby only lived 16 days from the abrupt onset. In my second case, also aged one, although I realised the extreme urgency, my tender-hearted resident dared not increase the atropine beyond the first dosage of gr. 1/200, injected 4-hourly. On the 6th day gr. 4/100 dilated the pupils: the vomiting immediately stopped

and the baby recovered (similarly in a subsequent relapse). Timidity or delay in acute cases is too often dangerous. These cases are admitted simply as "vomiting," and hence are easily missed unless one insists on seeing the baby fed. In spite of pathetic thirst, the baby retained only one ounce of water which was returned non-acid. This alone proved cardiospasm, but X rays showed pylorospasm too.

Hypertrophic pylorospasm soon after birth is always associated (in boys) with phimosis. Suspecting that this also was due to spasm I microscoped the prepuce and found plain muscle in abundance. Often too there is tortuosity of the ureters in these cases—with thickening, specially of the longitudinal fibres. I suspect this may be a device for shortening and thus increasing the calibre of the spastic tube (relaxing a stretched rubber tube increases its bore). Often too the bladder is much hypertrophied, without explanation unless spasm of the sphincter is assumed.

All these "spasms" in the newly born are still mysterious, though deficient calcium is now alleged (Magnum). Does anxiety in some primitive form exist even in the womb, specially in the first-born? At birth, or soon after, the anxiety of a nervous mother may cause the infant to vomit "everything." Yet in the hospital ward vomiting ceases at once without medicine or change of diet (I have 3 such cases now). How does anxiety pass from mother to infant?

SPASM IN THE ADULT

Reverting to the adult gut, I know 3 doctors—all rather highly strung. Two were father and son—the latter neurasthenic; the third formerly had migraine and years of pylorospasm, culminating in duodenal ulcer. Each of them was liable to a tender thumb-shaped tumour parallel to Poupart's ligament, often palpable in the early stages of a very hot bath which also excited pilomotor spasm. I conclude that this is a spasm of the last 3 inches of the ileum. Similarly I believe that in the newly born the spasm and hypertrophy is in the prepylorus and not in the pylorus. In 3 such cases I could not find any nerve-cells in sections kindly prepared for me by Major N. T. Whitehead. And nerve-cells seemed very scarce and degenerated in the lower gullet of the cardiospasm infant. Hirschsprung's disease is due to achalasia of the anal sphincter (Hurst), and the megacolon may be cured by excision of its sympathetic ganglia.

In adults there are a few cases of obscure kidney pain, curable only by dissecting the sympathetic plexus off the renal vessels. The pain is due to spasm of the sphincters above and below the pelvis, which should contract about 20 times a minute and the resultant bead of urine be propelled peristaltically along the ureter. But, in neurotics, this wonderful machinery may go painfully astray and even antiperistalsis may be seen (Jona). Similarly there may be gall-bladder colic without stones or inflammation.

ANGIOSPASM

Passing to the great subject of angiospasm, an embolus in the femoral artery at once produces severe pain, doubtless from spasm. Angina pectoris may be produced by blockage of the coronaries, but cases have convinced me that spasm of the coronaries may also produce anginal pain—with very different prognosis and treatment. "Dead fingers," in nervous patients and in Raynaud's disease, are due to arteriolar spasm. Migraine (relieved by ergotamine) is usually considered a cerebral angiospasm; and the temporal and retinal arteries have been observed in spasm during an attack. True, the lateral ventricle has been found dilated in dead migraine subjects, but is it not possible that spasm in the arterioles, with relaxed venules, may swell the choroid plexus (as in blue "dead fingers") and thus dilate the ventricle, possibly by blocking the exit? In epilepsy (which may occur in Raynaud's disease) the retinal vessels have been seen in spasm; and we know that convulsions may result from cerebral anæmia, as they do in severe heart-block. Anxiety may increase blood pressure unduly, presumably by a generalised angiospasm.

Asthma is perhaps the most blatant blunder of plain muscle and is illuminating in its heredity, in its allergic or psychological causation, and in the temperament it demands—sensitive, intelligent, anxious, striving, and idealistic.

DIAGNOSIS

How shall we recognise blunders of plain muscle—for which all clinicians must constantly be on the alert? They occur in the asthma type of temperament, and nearly always the patient reveals more than one kind of blunder. If you suspect pylorospasm as the cause of hunger pain, look for confirmation in cold extremities, colon palpable as a cord (which I call the anxious colon), or for frequent micturition or spasmodic dysmenorrhœa. Expect to find exhaustion, chill, or worry as causes of the attack, or perhaps alcohol which to these people is often poisonous. If there is cardiac pain, look in the legs for intermittent claudication to confirm coronary spasm, or you may find improvement with moderate exercise or a history of masturbation (penance for a guilt-complex, Crookshank). Ask too if there is a family history of asthma or migraine: repeatedly I have found (with Ryle) that migraine in the twenties and thirties has been replaced in the forties and fifties by spasmodic blunders in the gut (or in the heart). Next we have to eliminate allergy from the air or diet as the cause of spasm, or the reflex causes such as gall-bladder, duodenal ulcer, or chronic appendix.

Finally we have to search for psychological causes of spasm, such as grief, frustration in sex or ambition, or conflicts in the subconscious between inculcated, altruistic ideals and the inborn, primitive, selfish desires. Without forsaking psychological common sense, we may by persuasion, explanation, interpretation, and suggestion do much to cure these unhappy patients. We may revolutionise their attitude to their illness, and remove fear. "You have not cured him, but you have made him a new man" a doctor once wrote me. Ask yourself what the subconscious gains by the invalidism: that is the way to detect its motives. Even if only suspected and not precisely convicted, the subconscious may abandon its monkey-tricks with plain muscle.

PHARMACOLOGY

As to the pharmacology of plain muscle, we may very roughly condense it into: (1) The sympathetic and adrenaline conduce to "Fight or Flight" by producing relaxation in the bronchi or coronaries, and spasm elsewhere. (2) In the gut, vagus action increases peristalsis and opens sphincters: the sympathetic shuts them. (3) Vagus action is decreased by atropine and increased by acetylcholine when guarded by eserine. (4) Sympathetic action increased by adrenaline, benzedrine, and ephedrine, decreased by ergotamine. (5) Bromide or Luminal soothes or shields them both.

Even this brief survey shows how the study of plain muscle conducts us all over the body-mind. Moreover it makes us study medicine as we should—not as a honeycomb of vertical compartments labelled lungs, kidneys, brain, &c., but in a broad horizontal section through them all, at every age.

BLUNDERS OF PLAIN MUSCLE CAUSED BY ALLERGY

Allergy is a state of sensitiveness to various chemical stimuli so great that marked symptoms are produced to which the normal person is immune. Allergy manifests itself: (1) by spasm of plain muscle as in asthma or migraine; (2) by increased capillary permeability as in hay-fever, urticaria, giant œdema, eczema; (3) by hypersecretion as in mucous colic, Curschmann's spirals; (4) by a marked eosinophilia.

We are compelled to consider allergy in this paper because it is a non-nervous cause of blunders of plain muscle. Choline may be the connecting link, for Dale found that shock produced by anaphylaxis (artificial allergy) and vagus irritation were both accompanied by the production of choline. And choline is antagonised by atropine which often benefits the anxiety state. But there is still confusion, for the allergen in allergy is not choline but histamine which can produce wheals and spasms and is neutralised by adrenaline. It is repugnant to postulate two chemical agents to produce spasm of plain muscle: can it be that in chronic fear (anxiety states) choline is the agent and atropine the remedy; while in allergy or acute emotional spasm histamine is the agent and adrenaline the remedy? That seems in accord with clinical experience. For adrenaline not only relieves asthma but also angina, specially in migraine subjects. Angina, enuresis, and spasmodic dysmenorrhœa are said to be curable allergically by avoiding wheat or milk or eggs.

Experimentalists now tell us that allergy is not a help to immunity but a hindrance. This I disbelieve, for biologically allergy is not likely to be a merely harmful, puckish freak. And clinically we find that adult allergics have a high immunity—e.g., asthmatics rarely develop tubercle. Yet the allergic infant with eczema betrays a low immunity by often dying of infectious diarrhœa in hospital (15 per cent.) and by his subsequent liability to bronchitis attacks. Then again the Mantoux test suggests that after sensitisation to tubercle the tissues react allergically with increased hostility to tubercular invasion—i.e., increased immunity. Hence I conclude that allergy is a gradual but stormy means of immunity in a hypersensitive subject.

But what is the advantage of this hypersensitiveness to chemicals, specially foreign proteins? I have collected some evidence—from history, geographical medicine, from a veterinary (Mr. J. P. Cook), and from Dr. G. M. Vevers at the Zoo—which indicates that allergy is a product, perhaps necessary, of civilisation. Each of us is an instrument on which our surroundings play, and the tune is now far more rapid and complicated. Bacteria are evolving in virulence presumably, and all contain protein. It seems that—to be safe—it may be advantageous to respond very sensitively to any foreign protein even if that involves our responding painfully to harmless ones like pollen. We must also—to be successful in civilised life—respond very sensitively to countless new nervous stimuli; and do we not find that, on the whole, sensitive people are successful modern citizens? But the penalties of hypersensitiveness are neurosis and allergic disorders—both rapidly increasing. Let us therefore return to Nature when we can: in the wild creature plain muscle does not blunder.

Discussion of this subject at the Hull Medical Society (1936) elicited (inter alia) that 40 out of 50 cases of severe primary dysmenorrhœa were cured by presacral neurectomy (Mr. A. Patrick). Dr. G. Griffiths said that in primary uterine inertia (cervix in spasm, body relaxed) the patients were always of the sensitive anxious type. Mr. J. N. Young said that the kidney pelvis remained full like a ventricle, and that spasm of its outlet might cause regurgitation past the little sphincters of the calyces, or cause chronic pain from tension which might proceed to hydronephrosis: sympathectomy cured 23 out of 28 cases. Dr. Eric Lewis quoted 2 heavy smokers (doctors) with angiospasm and spasmodic abdominal pains cured by giving up smoking.

CONCLUSION

To sum up, I submit that, in blunders of plain muscle which are not reflex or allergic, the subconscious should be candidly blamed: no one minds it being made the scapegoat. And in the striving anxious type it is the real culprit, causing invalidism from the exhausting conflict. For the attitude of the conscious mind in these idealists is always beyond reproach. And if they were not idealists there could not be this conflict between their altruism and their primitive or selfish desires. In the hearty sinner or completely selfish (or truly religious, Ross) there is never neurasthenia. In willing and intelligent patients, if not too old or obsessed, such simple doctrines may be successfully applied, and the doctor may help conscious reason to conquer unconscious unreason.

A SISTER FOR "ORION"

Two years ago the Orient liner *Orion* took a party of guests from Tilbury to Southampton on the eve of her maiden voyage, and on August 20th her younger sister, *Orcades*, celebrated her coming-out in the same hospitable way. She is a fine girl, carrying her 23,500 tons elegantly and with nice regard for line. She can also carry—and very comfortably at that—463 first-class and 605 tourist passengers, on decks that range down to the letter H. The first-class cabins are charming bedrooms with dressing tables and cupboards built in, and hand-basins flanked by every necessary gadget, including a large thermos jug for the night-starved. For hedonists who like something more than comfort there are flats available, with a front door and hall, bedroom, bathroom, and lounge; and a pantry where glasses can be washed and drinks cooled in an ice-chest. These and some of the other cabins are air-conditioned. The tourist cabins, set deeper in the layer-cake of decks, have port-holes instead of windows, and, in some cases, accommodate four in space which higher up would be allotted to one or two; but they are adequate, and their fittings, though simpler than those in the first class, are dignified and serviceable.

On D deck is the ship's surgery, under the charge of Mr. J. A. McIlroy, a surgeon well known for his share in expeditions to the antarctic and for performing the first surgical operation undertaken in those regions. The consulting-room is equipped with a couch which can be folded up into a cupboard like a cottager's bed, and a dark recess where eyes may be examined. The dispensary holds a generous assortment of drugs, and an ice-chest so well stocked with sera and vaccines that the average shore-going practitioner may feel a little envious on looking through them. The sick bay lies at the stern; there are two general wards, one for men, one for women, and two isolation wards. Each ward is self-contained with its own bathroom and pantry, and each can take from four to seven patients. This accommodation is found to be sufficient except in epidemics. The

The first-class children's playroom.

beds look comfortable, and each has a tray hooked to the rail and a bell attached to the head.

The general rooms of the ship are cheerful and well lighted. Their decoration has been in the hands of Mr. Brian O'Rorke. In the first-class lounge the colour scheme is in plum, blue, and buff, and a group of fabulous but agreeable horses prance across the foreward wall, painted there by Mr. John Armstrong. The library, lying directly under the bridge, is panelled in plane wood, pink and calm; the books range heroically from murder to biography, determined to please all comers. In the tourist dining-room a colour scheme of pacifying green and grey suggests to the medical practitioner that he has accidentally strayed into the Maudsley Hospital. The first-class dining-room is panelled and there has been laudable restraint in the use of chromium plating. A remarkable composition of Neptune, apparently succumbing to an attack of surrealism, dominates the room. Games decks are roomy and equipped for all the pastimes which help to alleviate the leisure of travellers—deck-tennis, shuffleboard, quoits, and devices to comfort the golfer deprived of his drug. There are two excellent swimming pools, one for each class.

Children travelling first class are going to have a good time in a playroom where the floor is mapped out in islands and *Orcades II* is waiting to put to sea. Rivals of the captain may conduct the voyage from a miniature bridge equipped with two steering wheels, or hoist the Jolly Roger on the halyard thoughtfully provided for the purpose. Tourist children do not come off so well. Their playroom, though larger, is painted a rather gloomy shade of blue, with white above, and the floor is said to be "laid out for games of the hopscotch variety." But, to the expert, this chessboard and cartwheel arrangement will show a lamentable ignorance of the finer points of hopscotch on the part of the designer. Perhaps they didn't play it at his university.

The public rooms throughout are a foot higher in *Orcades* than in *Orion*. The air conditioning is as effective as in the older ship and is therefore suitable for voyages in the tropics.

WHO'D BE A DOCTOR?

Anthony Weymouth is not only a doctor but also a practised writer who writes, as it may be suspected that he lives, with zest. His reminiscences[1] appear to flow easily from his pen and can be read no less easily. The first part of the book describes his student days and early experiences as a locum tenens. Part II deals with general practice in full swing in pre-war London, Part III with his war experiences as an officer in the R.A.M.C., and Part IV takes up the thread of private life and civilian practice once more. Primarily interested in the psychological aspects of medicine and without actually pleading the cause of drastic change, he doubts whether the training given to the medical student in this country equips him as adequately as it might for the problems of general practice; a doubt shared, as we have recently shown, by many others. This is a lively book, full of good stories and containing much humour and homely wisdom. Like many another harassed doctor the author is comforted to reflect that his life "may not have been altogether useless" and he has found it a source of satisfaction to be "always welcomed by other people." For this reason, if for no other, he would hate to be a rent-collector: "the poor chap's never welcome." This autobiography is to be commended alike to doctors and layman who like to know how the other fellow lives, and what he thinks.

[1] Who'd be a Doctor? By Anthony Weymouth. London: Rich and Cowan. 1937. Pp. 340. 8s. 6d.

CONTROL OF TRAFFIC IN DRUGS

ATTENTION has been recently directed in India and elsewhere to the adulteration of drugs and the need for pharmacy legislation. The Advisory Committee of the League of Nations on Dangerous Drugs has drafted a set of rules for the effective control of pharmacies suitable for the use of Governments. They provide for the licensing of pharmacists, the registration of premises, and periodical inspection. These have been prepared primarily to deal with narcotic drugs but may well be adopted in those countries where no Pharmacy Acts are in operation. The first rule requires that "no person should be permitted to practise as a pharmacist unless he has a licence or certificate granted by the State or some other competent authority to the effect that he has the requisite theoretical and practical training." They also provide that pharmacists should not dispense drug prescriptions unless they are acquainted with the signature of the prescriber and that the premises of the pharmacist and all books, registers, and prescriptions or other documents kept by him should be readily available for inspection. Unauthorised vendors of drugs make large profits by adulteration or the admixture of some inert substance with the drug. Cocaine is thus largely diluted and sold to addicts at outrageous prices. Investigations by the

Advisory Committee of the prices of drugs in illicit traffic in Canada, in Egypt, and in India revealed such considerable variations in prices that no definite conclusion was drawn. Prices for morphine, heroin, and opium for smoking in Toronto, Winnipeg, Edmonton, and Vancouver varied widely in different districts and even in different seasons. Nor is it always possible to determine the source from which illicit narcotics are derived. Thus in several cases of seizures of illicit cocaine imported into India the country of origin was not traced, though Japan was suspected. A well-known brand of cocaine known as Fujitsuru has for ten years been found in illicit traffic in India, but the whereabouts of its manufacture and export have not been discovered. It is, to say the least, doubtful whether all the sixty sovereign States who are parties to Hague Convention of 1912 are complying with the undertaking therein contained to "enact pharmacy laws or regulations to limit exclusively to medical and legitimate purposes the manufacture, sale, and use of morphine, cocaine, and their respective salts."

HÆMACYTOMETER COUNTING CHAMBERS AND HÆMACYTOMETER DILUTION PIPETTES

THE British Standards Institution has just issued a specification for hæmacytometer counting chambers and hæmacytometer dilution pipettes. The accuracy of a blood count depends on the skill of the operator in obtaining a representative sample, in carrying out the dilution, and in the use of the counting chamber. It is also limited by the errors of the apparatus employed. In the preparation of this specification particular attention has been paid to the latter sources of error. The accuracy of the final count depends, for example, on the accuracy of a number of elements of the counting chamber—e.g., accuracy of ruling, accuracy of depth, and departure of under surface of cover glass from a plane. In view of the number of possible sources of error the tolerances on individual elements had of necessity to be kept small in order to avoid the possibility of a comparatively large error in the final count due to an accumulation of small errors. The committee, however, did not approach the question of tolerances in a purely theoretical manner. On the basis of measurements carried out at the National Physical Laboratory on samples submitted by manufacturers as representative of current production, the tolerances were also related to the degree of accuracy attainable in manufacture without unduly increasing the cost of production. Copies of this specification (No. 748–1937) may be obtained from the British Standards Institution, 28, Victoria-street, London, S.W.1, price 2*s*. 2*d*. post free.

AN INTRODUCTION TO BIOLOGY

IT is rare for any author to succeed in the dual purpose of providing an introduction to the study of the human body suitable for the biological student and also for the general public. Mr. Davenport has done so only in those parts of his book [1] which deal with developmental anatomy. Elsewhere the biologist will be constantly annoyed by the misleading simplification of complex issues. That nerves convey an electric current and that genes are catalysts are two among many statements which should either have been omitted or amplified with some discussion of the known facts. The layman will undoubtedly find much to interest him, though he will need to have had a thorough grounding in the elements of the subject if he is to understand certain sections. For example, the chapter on the nature of the genes will probably not be intelligible to the uninitiated, and the omission of the modern conception of the interaction between genes in a "gene complex" is regrettable. The general reader, again, will not find it easy to distinguish between speculation and established fact. Useful bibliographies are given at the end of each chapter, and reference to some of the works quoted will clear up difficulties which this one leaves unsolved.

[1] How We Came by Our Bodies. By C. B. Davenport. London: Macmillan and Co. 1937. Pp. 401. 10*s*. 6*d*.

THE EVOLUTION OF SOCIAL HUMAN LIFE

As a simple exposition of the principles of biology in relation to other branches of human knowledge the "Science of Life" is a masterpiece. It has now been revised and republished in a series of eight parts of which the last [1] has reached us. This volume deals with the evolution of the human social life, the relationship between civilised man and his environment, health and disease, and closes with a section on the present state of human society with some speculation concerning the future. A popular account of the implications of a science as young as biology must inevitably include speculation annoying to the specialist and be imbued with a particular point of view. There is little danger here, however, that the reader will be misled into confusing opinion with established fact, and those who have read other works of the senior author will have little difficulty in recognising his familiar but always stimulating hand in some of the concluding sections.

[1] The Biology of the Human Race. By H. G. Wells, Julian Huxley, and G. P. Wells. London: Cassell and Co. 1937. Pp. 205. 4*s*.

Births, Marriages, and Deaths

BIRTHS

NOLAN.—On August 30th, at Welbeck-street, W.1, the wife of Dr. Leo Nolan, Hendon, of twin sons.

PAKENHAM-WALSH.—On Sept. 2nd, at Lancaster, the wife of Dr. R. Pakenham-Walsh, of a daughter.

PICKLES.—On Sept. 2nd, at Carlton-road, S.W.15, the wife of Dr. W. J. Reed Pickles, of a son.

MARRIAGES

BIRCH—JOHNSON.—On August 26th, at the Parish Church, Campden, Glos., Charles Birch, M.R.C.S., to Enid Gertrude Vera Johnson, of Liverpool.

GROGONO—PRESTON.—On Sept. 4th, at St. Helen's Church, Abingdon, Keith Grogono, M.B., B.S. Lond., to Molly Preston, only daughter of Dr. and Mrs. Preston, of Abingdon.

HALL—WILSON.—On Sept. 3rd., at Harrow, Alexander Stephenson Hall, M.R.C.P., to Edith Mary Partington Wilson, M.B.

PATERSON—CROSS.—On Sept. 1st, at St. Philip's Church, Alderley, Ronald Simpson Paterson, M.D., to Nancy Katherine, only daughter of the late W. Haslam Cross, J.P., of Cheadle, and Mrs. Cross.

RYAN—ESPERSON.—On Sept. 4th, at Notre Dame of Victory, Kensington, Dr. Thomas Joseph Ryan, eldest son of Mr. and Mrs. James Ryan, of Dulwich, to Irène, only daughter of Mr. W. V. Esperson, of Kensington.

STEPHENS—MACGREGOR.—On August 28th, at the Priory Church of St Bartholomew-the-Great, E.C., Keith Fielding Stephens, M.B., to Margaret Ann, only child of Mrs. M. MacGregor.

THOMPSON—SHAW.—On Sept. 6th, at the Church of the English Martyrs, Streatham, Harold Humphrey Thompson, M.R.C.S. Eng., to Joan Kathleen Mary, only daughter of the late Dr. F. J. F. Shaw, C.I.E., Pusa Bihar, and Delhi, India, and Mrs. Shaw, Streatham.

WILLIAMS—JEWSON.—On Sept. 2nd, 1937, at Eaton Parish Church, Norfolk, Denis John Williams, M.D., B.Sc. Manch., M.R.C.P. Lond., to Joyce Beverley Jewson, M.B., B.S., D.P.H. Lond., D.C.H., of Norwich.

DEATHS

BRAINE.—On Sept. 1st, at Grove End-gardens, N.W.8, Charles Carter Braine, F.R.C.S. Eng., aged 78.

BURGESS.—On Sept. 2nd, at Eastbourne, Edward Arthur Burgess, M.R.C.S. Eng., L.S.A., Senior Surgeon to the Peruvian Navy, in his 87th year.

GILLEN.—On Sept. 6th, in London, John Besley Gillen, M.B. Adelaide, aged 42.

HUBBARD.—On Sept. 5th, at St. Leonards-on-Sea, Walter Lovett Hubbard, M.D. Brux., M.R.C.S. Eng., aged 79.

KIDD.—On Sept. 1st., at Eltham, S.E.9, Archibald Kidd, M.R.C.S. Eng., D.P.H., R.C.P.S. Eng., late of Gravesend.

MACKINNON.—On Sept. 5th, at Hove, Major Archibald Donald Mackinnon, C.M.G., O.B.E., M.D. Aberd., of Dunringell, Isle of Skye.

SINCLAIR.—On Sept. 2nd, Harold Weightman Sinclair, M.D. Lond., D.P.H., of Norbury, aged 60 years.

WATT.—At 15, Molesey-avenue, Auckland Park, Johannesburg, South Africa, on 3rd September, 1937, Andrew Hutton Watt, M.B., C.M., F.R.C.S. Edin.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.